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AN INVESTIGATION OF THE RELATIONSHIP BETWEEN
WRITTEN COMPOSITION AND READING ABILITY
AND READING HABITS

by

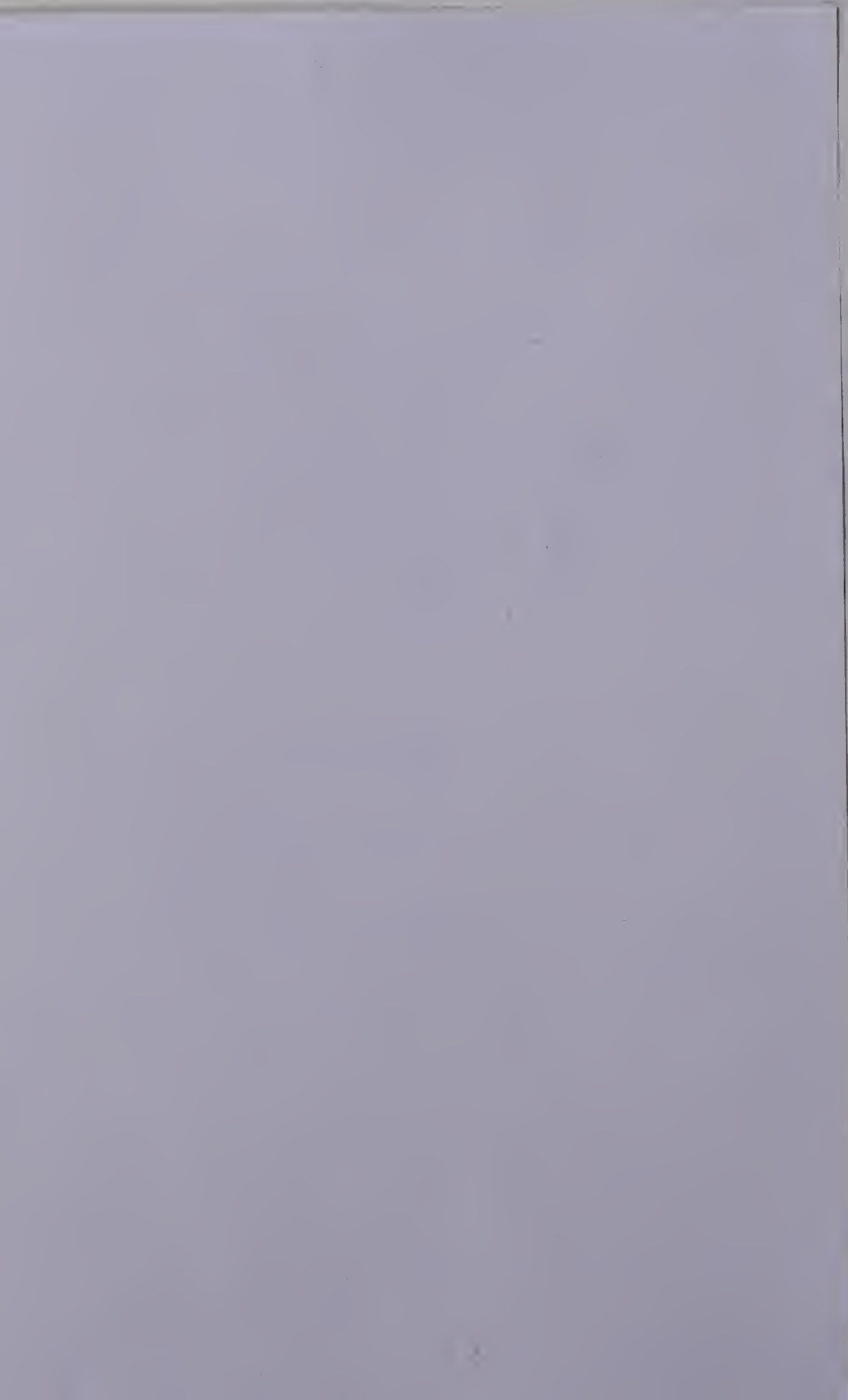
EDWARD AUSTIN JONES

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE
OF MASTER OF EDUCATION

DEPARTMENT OF SECONDARY EDUCATION

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ABSTRACT

The purpose of this study was to ascertain whether students' written composition ability is related to their reading ability and to their reading habits. Specifically, the relationship of the students' achievement in written composition to their reading ability was investigated in the presence of four variables: sex, intelligence, socioeconomic status of the family, and the teacher variable. The relationship of the sex, intelligence, and socioeconomic variables to students' achievement in written composition was also studied. In addition, students' reading habits were investigated to determine their discriminating power among effective, moderately effective, and ineffective writers of written composition.

One hundred forty-seven grade ten pupils from one large Edmonton high school comprised the sample. The achievement of the eighty boys and sixty-seven girls in written composition was determined by their writing of Form 2A of the STEP Essay Test. Reading ability was measured by the Cooperative Reading Comprehension Test. Socioeconomic status was determined by an occupational class scale and by a Home Index Scale. The intelligence scores used were those obtained on the Henmon-Nelson Test of Mental Ability. By applying the statistical technique of multiple linear regression it was possible to determine the contribution made by each variable to the variance of students' scores on the STEP Essay Test, and thus determine a measure of the relationship of the different variables in the presence of other variables to students' achievement in written composition. Reading habits were determined from students' responses to a nine-item questionnaire on reading habits.

The responses of the three groups of writers, effective, moderately effective, and ineffective, to each item were tested for significance.

It was found that the major hypothesis, postulating a significant relationship between students' written composition scores and their reading ability scores, when tested in the presence of intelligence, sex of the pupil, the socioeconomic status of the family, and the teacher variable, was supported. Further analysis revealed that in the presence of these other predictor variables, the vocabulary scores of the reading ability test but not the reading comprehension scores significantly contribute to the variance of scores on the STEP Essay Test. It was found that both sex and intelligence contribute significantly to the variance of students' composition scores, when the relationship was tested in the presence of students' reading scores, socioeconomic scores, and the teacher variable. The socioeconomic level of the family, when tested in the presence of the other variables does not significantly contribute to students' composition scores.

The effective writers, the moderately effective writers, and the ineffective writers differ significantly with respect to the following reading habits: (1) the number of books read per year, and (2) the extent to which they find reading a pleasurable activity. They do not differ significantly with respect to: (1) the number of books in their homes, (2) their frequency of reading magazines, (3) their frequency of reading newspapers, (4) the time of reading, (5) their reading of poetry, essays, plays, newspapers, magazines, fact, and fiction, and (6) their reading of the different sections of the newspaper.

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CHAPTER I

NATURE OF THE STUDY

I. BACKGROUND

Although there is little reliable evidence that students are writing less well than comparable students wrote twenty, forty, or a hundred years ago, few educators are satisfied with the present quality of student writing, particularly in the secondary school. From laymen, teachers, and university instructors various suggestions and sometimes definitive answers for improving instruction have been forthcoming. Not surprisingly, many alleged panaceas for teaching written composition have been suggested and many are still being proposed by English teachers today.

From the beginning of the nineteenth century, when students were made to memorize "Laws of Discourse", to today's use of structural and transformational linguistics, many a catholicon has been advocated. The "daily theme", the notion that the "paragraph is the composition in miniature", the study of good literature, the idea of "correctness as the supreme virtue in composition", the use of general semantics, and the combined study of "communication skills", have all received attention.¹ In spite of the long and discouraging record of apparently unsuccessful methods, English teachers today are still optimistic about finding ultimate solutions to the problem of teaching young people to write well.

¹ Albert R. Kitzhaber, Themes, Theories, and Therapy (New York: McGraw-Hill Book Company, Inc. 1963), pp. 73-92.

Thus, Kitzhaber notes:

An increasing number of English teachers in schools and colleges are now busily involved with "team-teaching", lay readers, closed circuit television, overhead projectors, "resource teachers", "teacher aids", etc., in the hope of "scoring a major breakthrough".²

However, the evidence is fragmentary on whether these devices will greatly accelerate the process of teaching students to write well and whether these devices will make the task substantially easier for the students.

One main thesis propounded by numerous articles has been concerned with the necessity of students having frequent practice in writing and with this writing being subjected to careful evaluation by the teachers. However, the results of research appear to be divided regarding the effects of frequent writing practice and of rigorous evaluation. On the one hand, Lokke and Wykoff report an experiment in freshman composition at Purdue University in which the groups doing twice as much writing had fewer failures and showed the greatest improvement.³ On the other hand, Dressel, Schmid, and Kincaid conclude from their study conducted at Michigan State University that mere frequency of writing is not enough to improve the quality of written expression.⁴

² Ibid., p. 75.

³ Virginia Lokke and George Wykoff, "Doubling Writing in Freshman Composition Experiment," School and Society, LXVII (November, 1948), pp. 437-439.

⁴ P. Dressel, J. Schmid and G. Kincaid, "The Effect of Writing Frequency Upon Essay-Type Proficiency at the College Level," Journal of Educational Research, XLVI (December, 1952), pp. 320-322.

However, Buxton, in his experiment, conducted at the University of Alberta, Edmonton, indicates that a combination of frequent writing and rigorous evaluation, associated with other procedures, can produce an improvement in written expression.⁵ Again, in contradiction to this finding, Arnold, in her research with two high schools in Pinellas County, Florida, concludes that:

1. Intensive evaluation is seemingly no more effective than moderate evaluation in improving the quality of written expression.
2. Frequent writing practice does not in itself improve writing.
3. There is no evidence that any one combination of frequency of writing and teacher evaluation is more effective than another.
4. Frequent writing and intensive evaluation are no more effective for one ability level than are infrequent writing and moderate evaluation.⁶

These studies clearly emphasize the need for additional research in written composition, since the literature reviewed indicates the insecurity of the assumption that frequent writing practice or detailed marking and grading by the teacher results in improvement in student performance. Research should especially be concerned with determining which variables have a significant relationship to students' skill in written composition.

Recently, several studies, with varying results, have attempted to classify reading as one of the variables affecting students'

⁵ Earl W. Buxton, "An experiment to Test the Effects of Writing Frequency and Guided Practice Upon Students' Skill in Written Expression," Alberta Journal of Educational Research, V (June, 1959), pp. 91-99.

⁶ Lois Arnold, "Writer's Cramp and Eyestrain - Are They Paying Off?" English Journal, LIII (January, 1964), pp. 10-15.

skill in written composition. Studies by Heys⁷ and Christiansen⁸ reveal that extensive reading, in lieu of extra theme writing, contributed significantly to promoting growth in composition writing. Similarly, Monk⁹ found that children whose homes were well supplied with books and whose leisure-time reading was intensive tended to be superior writers. However, studies by Wyatt¹⁰ and Nichols¹¹ offer somewhat contradictory evidence to that of Heys, Monk, and Christiansen, and suggest that teachers be cautious in their assertions that reading is an avenue to the improvement of writing.

While one might expect intensive reading to result in improved writing, clearly this is not substantiated empirically. It may be that certain students, even though they read extensively, may not possess the reading abilities and skills necessary to gain maximum advantage from their reading. A more germane concern for research would thus be with determining whether there is a relation-

⁷ Frank Heys, "A Theme A-Week Assumption: A report of an Experiment," English Journal, 54 (May, 1962), p. 322.

⁸ Mark A. Christiansen, "An Experimental Study in Composition: Extensive Writing vs. Some Writing Plus Reading," University of Kansas Bulletin of Education, 19 (May, 1965), p. 131.

⁹ H. K. Monk, "A Study to Determine the Relationship Between Children's Home Environments and Their School Achievement in Written English," (Doctor's thesis, University of Washington, 1958). Abstract: Dissertation Abstracts 19(1958), p. 1619.

¹⁰ M. Wyatt, "A Study of the Relationship of Extensive Reading to Certain Writing Skills of a Selected Group of Sixth Grade Children," University of Kansas Bulletin of Education, 19 (May, 1965), p. 18.

¹¹ D. C. Nichols, "Research in Written Composition," University of Kansas Bulletin of Education, 19 (May, 1965), p. 104.

ship between students' written composition ability and their reading ability. Such is the concern of the investigator in the present study.

If such a relationship is found to exist, then English teachers should take cognizance of the fact and direct their teaching accordingly. In fact, composition teaching practices could assume a greater significance if teachers knew just what variables are associated with students' ability to write. For example, what is the relationship of the following to composition ability: intelligence, socioeconomic status, sex, personality, knowledge of grammar, knowledge of logic, English class attitudes, creativity, prior experiences, motivation, reading ability, and reading habits? Ultimately, the teacher's knowledge of such factors and his ability to apply this knowledge must be regarded as variables associated with his method of teaching composition and hence his success or failure. Knowledge of these variables becomes increasingly important in a culture that progressively emphasizes higher degrees of language skill.

An inspection of existing literature reveals that one of the faults of many studies dealing with composition is that they do not have sufficient control on variables which are related to the criterion. Many researchers have limited themselves to bivariate studies and have neglected other variables which may in fact be variables which influence criterion scores. Other investigators have kept their experimental designs tailored to the old rule, "Keep all variables constant but one". They have been much concerned with

"matching experimental subjects," "equating cell frequencies" in analysis of variance, and similar devices for fitting research problems into "standard" designs and prescribed analysis.¹² This is because the hypothesis could be conveniently tested by two-variable analysis or perhaps more frequently because multivariate analyses required laborious calculations which are sometimes inefficient without the use of a computer. With the aid of high speed computing and programs involving the use of multiple linear regression analysis an investigator today is able to take into account a greater number of relevant variables. In short, investigators can more closely approach the philosophy expressed in Mood's statement: "One well-designed experiment, taking into account all relevant factors, is worth dozens or even hundreds of experiments that study one factor at a time keeping the others constant."¹³

It is hoped that in the present study, which is multivariate in nature, more valid conclusions can be drawn. Instead of using "matched groups", confined to specific ranges and narrowing the field of generalization, actual scores on other possible predictors are incorporated into the experimental design. Thus, the relationship of reading ability to composition writing is measured in the presence of intelligence, sex, socioeconomic status of the family, and the teacher variable. It is hoped that as a result of this investigation a more

¹² Robert A. Bottenberg and Joe H. Ward, Jr., Applied Multiple Linear Regression, Clearinghouse for Federal Scientific and Technical Information. U. S. Department of Commerce, Technical Documentary Report PRL - TDR - 63 - 6 (Washington: Government Printing Offices 1963), p vi

¹³ A. M. Mood, Introduction to the Theory of Statistics (New York: McGraw-Hill Book Company, Inc., 1950), p. 358.

accurate knowledge of the relationship of reading ability and reading habits to written composition ability will be known.

II. PROBLEM

The purpose of this study was to determine whether students' written composition ability (as measured by the STEP Essay test) is related to their reading ability (as measured by the Cooperative Reading Comprehension Test) and reading habits. However, the investigator realizes that the nature of any relationship that might exist is complicated by other factors, especially intelligence, sex of the pupil, socioeconomic status of the family, and the teacher's methods, which have been shown to be related to achievement in written composition. Thus, the study was designed to determine whether students' composition ability is related to their reading ability when tested for significance in the presence of sex, socioeconomic status, intelligence, and the teacher variable. The study sought also to investigate students' reading habits to determine their discriminating power among effective, moderately effective, and ineffective writers of written composition. Although of secondary importance, the relationship of intelligence, sex of the pupil, and socioeconomic status of the family, skill in written composition was also considered.

This investigation of the relationship between students' skill in written composition and their reading ability and reading habits was conducted at the senior high school level (grade ten) since it is at this level that composition writing, as opposed to paragraph writing, is stressed in most English curricula.

III. DEFINITIONS

For purposes of this study, the following definitions were adopted:

Composition Ability Composition ability is a measure of students' writing performance on a free-response test of writing ability (Level 2, Form A of the Sequential Tests of Educational Progress - STEP).

Effective Writers Effective writers are those who make scores of 10-14 on the STEP Essay Test.

Moderately Effective Writers Moderately effective writers are those who make scores of 6 - 9 on the STEP Essay Test.

Ineffective Writers Ineffective writers are those who make scores of 2 - 5 on the STEP Essay Test.

Reading Ability Reading ability is a student's total score on the Cooperative Reading Comprehension Test (Part I plus Part II).

Vocabulary Score This term refers to the number of items a student has correct in Part I (Vocabulary) of the Cooperative Reading Comprehension Test.

Reading Comprehension Score This term refers to the number of items a student has correct in Part II (Reading) of the Cooperative Reading Comprehension Test.

Socioeconomic Status The socioeconomic status of the family is the relative position of a family on a continuum as determined by a combination of (1) possession - non-possession of material goods (measured by a modified form of the Gough Home Index Scale), and (2) the father's occupation (measured by the Blishen Occupational Class Scale).

Intelligence This term refers to a score on the Henmon-Nelson Test of Mental Ability.

Sex This term refers to a dichotomous classification as male or female.

Reading Habits The term reading habits refers to the reading a student does in his free time whether at school, at home, in the library, or elsewhere. It includes both what he reads (books, magazines, and newspapers), and when he reads.

IV. HYPOTHESES

Since the central concern of this study was to determine whether a significant relationship exists between students' composition writing ability and their reading ability, one main hypothesis was formulated:

Hypothesis 1 There will be a significant contribution to the variance of scores on the STEP Essay by the students' reading ability scores on the Cooperative Reading Comprehension Test, in the presence of intelligence, socioeconomic status, sex, and the teacher variable.

1a There will be a significant contribution to the variance of scores on the STEP Essay by the students' vocabulary scores on the Cooperative Reading Comprehension Test, in the presence of intelligence, socioeconomic status, sex, the teacher variable, and reading comprehension.

1b There will be a significant contribution to the variance of scores on the STEP Essay by the students' reading comprehension scores on the Cooperative Reading Comprehension Test, in the presence of intelligence, socioeconomic status, sex, the teacher variable and vocabulary scores.

A number of other variables were thought to be related to the criterion variable, essay writing ability. Thus, the relationship of intelligence, socioeconomic status, and sex to students' written com-

position ability were studied. The following hypotheses were investigated:

- Hypotheses 2a There will be a significant contribution to the variance of scores on the STEP Essay by the students' intelligence scores, in the presence of socioeconomic status, sex, the teacher variable, and the students' total reading scores.
- 2b There will be a significant contribution to the variance of scores on the STEP Essay by the students' socioeconomic scores, in the presence of intelligence, sex, the teacher variable, and the students' total reading scores.
- 2c There will be a significant contribution to the variance of scores on the STEP Essay by the students' sex, in the presence of intelligence, socioeconomic status, the teacher variable, and the students' total reading scores.

Another concern of the study was to determine whether any relationship exists between students' skill in written composition and their reading habits. A third hypothesis was formulated.

Hypothesis 3 There will be significant differences among the three groups of writers (effective, moderately effective, and ineffective) with reference to the following:

- a. The number of books in their homes
- b. The number of books they have read in the last year
- c. The extent to which they find reading pleasurable
- d. The specific reading habits they employ (with reference to the time of reading)
- e. The types of reading they prefer
- f. The number of magazines in their homes
- g. The frequency of their reading magazines
- h. The frequency of their reading newspapers
- i. The particular parts of the newspaper they prefer

V. DESIGN OF THE STUDY

Data used in this study were obtained from a sample of 147 grade ten students from a senior high school in Edmonton, Alberta.

Scores were obtained from the following sources:

1. an essay written by the students (Sequential Tests of Educational Progress, Level 2, Form A);
2. a test on reading ability (Cooperative English Tests: Reading Comprehension, Form 2 A);
3. a questionnaire on reading habits (prepared by the investigator);
4. a measure of the socioeconomic level of the students' families (by combining scores on the Blishen Occupational Class Scale and the Home Index Scale as modified by Elley); and
5. a measure of the students' intelligence (from the school records - intelligence as measured by the Henmon-Nelson Test of Mental Ability.)

The major analysis of the study utilized a statistical technique known as Applied Multiple Linear Regression Analysis, developed by Bottenberg and Ward, while to test Hypothesis 3 statistical analysis utilizing Chi Square tests was used.

VI. LIMITATIONS

In this study which seeks to determine whether there is a significant relationship between students' written composition ability and their reading ability in the presence of intelligence scores, socioeconomic scores, sex of the pupil and the teacher variable, it may be considered a limitation that other variables which are probably related to composition ability are not considered. Though one is free to suspect that students' oral language ability, their knowledge of linguistics,

their level of motivation and other variables do account for some of the variance of scores on the STEP Essay Test, no attempt was made in this investigation to incorporate them into the statistical design. If pupils were tested on these variables and their scores inserted into the unrestricted (general) model the amount of variance accounted for by the students' reading ability scores would probably differ and thus results different from those reported in this study would probably be attained.

It may also be considered a limitation of this study that only one essay was used as a measure of students' written composition ability.

In order to answer several of the questions on the Questionnaire on Reading Habits, students were required to remember their specific reading habits of the past year. It may thus be considered a limitation that there was no cross-validation of students' responses either with the home or with the school records.

Finally, the investigation is limited by the fact that the sample involved was entirely from one senior high school in Edmonton, Alberta. All generalizations should be made in the light of this limitation.

CHAPTER II

RELATED LITERATURE

I. READING IN RELATION TO COMPOSITION

Learning to write is both a cumulative and a complex process, the result of a variety of influences from a variety of interrelated sources. A recent paper prepared by the Junior High School Language Sub-Committee (Edmonton Public School Board) states that the most essential condition to the teaching of composition is the encouraging of the habit of reading to the point where a pupil develops a reservoir of ideas from which to draw. The paper reports that:

A recent survey of professional writers on how they learned to write revealed that the only item upon which they all agreed as being indispensable to learning to write well was that of wide reading. The ideas contained in literature reveal the actions, thoughts, feelings, dreams, and ideals of men everywhere and in all ages. Wide reading enables pupils to confirm and clarify their experiences by comparing them with those of others, at the same time enabling them to become acquainted with precise, forceful, and stimulating expression. The task of the composition teacher is to guide pupil reading and to stimulate pupil discussion so as to exploit fully the reservoir of ideas contained in books.¹

Hans Guth states that "by and large, the effective writer is the one who has first been a voracious reader."² Others, too have deemed it the business of composition instruction to expose the student to the written word. Hinsdale, writing seventy years ago, stated that "What ever adds to the pupil's store of facts and ideas, enhances his power

¹ Junior High School Language Sub-committee, "Secondary English Program," (Edmonton Public School Board, 1965), p. 2. (Mimeographed.)

² Hans P. Guth, English Today and Tomorrow (New Jersey: Prentice Hall, Inc., 1964). p. 172.

to think, and augments his linguistic resources will minister to the art of expressing himself in writing."³ Thus, many a successful writer can claim with Somerset Maugham that:

I read everything that came my way. My curiosity was such that I was willing to read a history of Peru or the reminiscences of a cowboy or a treatise on Provencal poetry or the Confessions of St. Augustine....I read a lot of history, a little philosophy and a good deal of science....I could hardly wait to finish one book, so eager was I to begin another.⁴

Although writers, critics, and teachers often testify to the power of good books in their lives, and although we are inclined to agree with Bacon that "Reading maketh a full man", such information is not sufficient from the research point of view. Russell states that "From the research point of view, however, the effects of reading are an uncharted wasteland in an otherwise well-mapped territory. We have discovered many facts about eye movements in reading, reading interests and tastes, and methods of reading instruction - but we don't know much about what reading does to people."⁵

To test the hypothesis that a theme a week should be required of all students, Heys set up an experimental study involving two eleventh-grade classes. One class wrote the equivalent of a theme a week, and the other was excused from practically all composition work for the entire year and used the time thus freed for an increased amount of in- and out-of-class reading. The results at the end of the year indicated that

³ B. A. Hindsdale, Teaching the Language Arts (New York: D. Appleton Company, 1896), p.

⁴ Guth, op. cit. p. 173.

⁵ D. H. Russell, "Some Research on the Impact of Reading," English Journal. 47 (October, 1958), p. 398.

both groups had improved about the same; but that if either class could be said to have made the greater improvement, it was the class that had done little or no writing."⁶

Influenced by these disquieting results, Heys decided to seek additional information on how students learn to write. Accordingly, in the following year, 1960, Heys repeated the experiment in eight classes in grades nine through twelve. The two classes in each grade, as closely matched as was possible under the normal sectioning practices of the school, were both taught by the same teacher. The students in one class, designated as a "writing" class, wrote the equivalent of a theme a week which was rigorously corrected by the teacher and revised or rewritten by the student. Students in the other class, designated as a "reading" class wrote, on the average, a theme every third week. However, the students in the "reading" class spent one period each week reading books which they had selected and brought to class. The experiment thus consisted of giving students in two classes of each of four grades a year's experience that differed in but one respect: the amount of reading and writing done. His study produced the following conclusions:

1. The claim that "the way to write is to write" is not substantiated by this experiment.
2. The claim that the ability to write well is related to the amount of writing done is not substantiated by this experiment.
3. For many students reading is a positive influence on writing ability.

⁶ Frank Heys, "A Theme A-Week Assumption: A Report of an Experiment," English Journal, 54 (May, 1962), p. 320.

4. The influence of reading on the ability to write appears to be a separate factor, not directly related to the teacher's personality and enthusiasm.⁷

Christiansen, following the work of Heys, conducted a similar study at the Metropolitan Junior College, Kansas City, during the Fall semester of 1963-64. He sought to discover whether there was any difference between two groups of students in the kind of improvement, if any, in composition writing at the end of the first semester in freshman English. Christiansen had an experimental group write three times as many themes as did a control group (24 themes as compared to 8 themes). Furthermore, students in the experimental group did not read prose selections from a regular freshman reader as did students in the control group, but rather approached the topic of theme writing in so far as was possible, strictly from a writing standpoint. The control group followed a somewhat traditional policy of a combination of reading and writing. Christiansen concluded that "The reading done in the control classes did as much to promote growth in writing as did the writing of sixteen extra themes in the experimental classes."⁸

Although the results of the studies by Heys and Christiansen partially sound the death knell of the much-touted "theme a week" method, more experimentation remains to be done before these findings

⁷ Ibid., pp. 321-322.

⁸ Mark A. Christiansen, "An Experimental Study in Composition: Extensive Writing vs. Some Writing Plus Reading," University of Kansas Bulletin of Education, 19 (May, 1965), p. 131.

are translated into curriculum design. If reading does have a relationship to students' writing ability, the question remains as to how much reading, and what kind, will produce the optimum effect on the students' ability to write. Also, what is the relationship of reading ability and reading habits to writing ability?

Although not specifically concerned with written composition, several studies have shown that a relationship exists between reading achievement and achievement in other language arts. A correlation study by Hughes based on measures of eight language abilities, including: reading, spelling, word meaning, language usage, capitalization, punctuation, paragraph organization, and sentence sense, for 195 fifth-grade pupils with I Q's in the range 95-110, indicated that a high score in one language ability is associated with a comparatively high achievement in other language areas.⁹ Studies by Traxler¹⁰ and Townsend¹¹ have also shown that there is a positive correlation between reading achievement and achievement in other language arts, even when intelligence is held constant.

Aukerman, however, working with 73 pairs of eleventh-grade students in a Detroit high school, investigated whether it was general

⁹ Vergil H. Hughes, "A Study of the Relationships Among Selected Language Abilities," Journal of Educational Research, XLVII (October, 1953), pp. 97-106.

¹⁰ Arthur E. Traxler, "Reading and Secondary School Achievement," 1946 Achievement Testing Program in Independent Schools and Supplementary Studies. Educational Records Bulletin No. 45 (New York: Educational Records Bureau, 1946), pp. 59-62.

¹¹ Agatha Townsend, "Reading and Achievement Test Scores in the Elementary Grades," 1946 Achievement Testing Program in Independent Schools and Supplementary Studies. Educational Records Bulletin No. 45 (New York: Educational Records Bureau, 1946), pp. 54-58.

or specific reading ability that is associated with eleventh-grade achievement. Although his students were carefully matched on intelligence, sex, color, age, half-grade - 11B or 11A, subject, hour of recitation, and teacher, one student in each pair had a high average in school marks; the other, a low. After studying the results of a number of standardized tests measuring reading comprehension and vocabulary development in general and specified fields, Aukerman drew the following conclusions: "Good students are much higher in general reading ability than are poor students;" and "In English good eleventh-grade students excelled poor eleventh-grade students in their general reading ability and in their specific reading ability to read literature."¹²

In a further study concerned with the role of reading ability in school achievement, Hinkelman computed the correlations between reading ability, as measured by teacher marks, and nine other curriculum areas for which teacher evaluations were given in the Chicago Public Schools. Thirty students for whom records were available for the 2-A, 5-A, and 7-A semesters in written composition, oral composition, social studies, arithmetic, spelling, science, music, art, and penmanship, comprised the sample. His results indicated that progress in seven of nine areas studied is "markedly related to reading for the three selected grades." Of specific interest for this investigation are the rho coefficients of 0.94 for the 2-A, 0.75 for the 5-A and 0.82 for the 7-A

¹² Robert C. Aukerman, Jr., "Differences in Reading Status of Good and Poor Eleventh-Grade Students," Journal of Educational Research, 41 (March, 1948), pp. 498-515.

between reading ability and written composition. Hinkelman explains that the high relationships are logical since in most of the areas of learning considered, reading ability plays an important part in the activities of those subjects, and that success in most schools depends on verbal type abilities such as found in reading.¹³

In an essay, "Interrelationships Among the Language Arts," reviewing the interdependence of reading and language, Hildreth maintains that:

Reading enriches language in several ways. Through reading, children grow in linguistic awareness; for the reader is brought into contact with meanings of terms that are new to him. the reading context gives practice in using correct sentences, and the child in the course of reading, learns about different kinds of words used in sentences....Reading stimulates a wish to write something in good form and also creates occasions for writing.¹⁴

Hildreth further states that:

1. From reading the pupil gains knowledge of vocabulary, sentence structure, grammatical form used in speaking and writing. Reading enriches vocabulary.
2. From reading the pupil derives generalizations about words and word-building.
3. Reading develops language sense and gives practice in using language correctly.
4. Reading furnishes ideas to write about and furnishes a basis for discussion.
5. Reading furnishes the stimulus and ideas for creative writing.¹⁵

¹³ Emmet A. Hinkelman, "Relationship of Reading Ability to Elementary School Achievement," Educational Administration and Supervision, XLII (February, 1956), pp. 65-67.

¹⁴ Gertrude Hildreth, "Interrelationships Among the Language Arts," Elementary School Journal, XLVIII (June, 1948), p. 539.

¹⁵ Ibid., p. 541.

Of particular interest with respect to students' reading habits is a study by Monk in Burnaby, British Columbia. His study was designed to ascertain whether the home environments of seven hundred grade-seven pupils are associated with their school achievement in written composition. He found that children whose leisure time reading was intensive, whose parents did considerable reading and whose homes were well-supplied with books tended to be superior writers. Furthermore, he found that the type of reading done tended to have less influence than the amount, and that there were more books in the homes of pupils who wrote better compositions and more newspapers and magazines in the homes of those who wrote poorer compositions.¹⁶

Other researchers, however, have had less encouraging results from their attempts to determine whether children who read more extensively than others are better writers of written composition. Wyatt conducted a study to determine whether a significant relationship exists between the amount of voluntary reading done by a selected group of sixty-five sixth grade children and their abilities in the following facets of writing: usage, spelling, capitalization, punctuation, vocabulary, and sentence structure. Each child wrote four compositions, two on vicarious experiences and two on real experiences. The amount of reading was determined by a questionnaire and library records for the previous three years. The study pro-

¹⁶ R. H. K. Monk, "A Study to Determine the Relationship Between Children's Home Environments and Their School Achievement in Written Composition," (Doctor's thesis, Seattle: University of Washington, 1958). Abstract: Dissertation Abstracts 19 (1958), p. 1619.

duced no conclusive evidence that the amount of reading within these groups was significantly related to the factors studied, although positive rank-order correlations at the five percent level of significance were obtained between the amount of reading and the use of more subordination and longer sentences among the very bright and between the amount of reading and spelling success among the average group.

Wyatt concludes that:

Until the time that conclusive evidence is available about the relationship of reading to writing, it would be wise for writers in the field of language education to be cautious in their assertions that reading is an avenue to the improvement of writing abilities.¹⁷

Nichols, in an essay on "Research in Written Composition", concludes: "We have told ourselves that the more the students write or the more they read the better they will write, but suddenly we cannot prove it."¹⁸ As the Braddock report points out, we do not know "What kinds of writing following what kinds of instruction for what kinds of students is yet appropriate."¹⁹

Conclusion

The studies summarized in the preceeding pages, while differing to a degree in objectives and approach from this investigation, are not unrelated to it. While raising doubts about the

¹⁷ M. Wyatt, "A Study of the Relationship of Extensive Reading to Certain Writing Skills of a Selected Group of Sixth Grade Children," University of Kansas Bulletin of Education, 19 (May, 1965), p. 18.

¹⁸ Duane C. Nichols, "Research in Written Composition," University of Kansas Bulletin of Education, 19 (May, 1965), p. 104.

¹⁹ Richard Braddock, R. Lloyd-Jones, and J. H. Ward, Research in Written Composition (Illinois: Champaign, National Council of Teachers of English, 1963), pp. 34-35.

outcome of frequent practice in writing, both Heys and Christiansen in their studies drew attention to reading as a factor which may produce improvement in the quality of students' written composition. Wyatt's study did not confirm this. However, her study was limited by the fact that the aspects of written composition actually measured in her study were narrow in scope, omitting those aspects of written composition which are larger than the unit of the sentence, for instance, the main idea and its analysis; the support of subordinate ideas with details, examples and reasons; and the organization of all elements into an orderly and meaningful whole. It is possible that these subjective factors dealing with the quality of writing are more closely related to the amount of reading which a child has done and to his reading ability than are the factors considered by Wyatt. The studies by Hildreth, Traxler, Townsend, Aukerman, Hughes, and Hinkelam all suggest that good achievement in the language arts is associated with good reading ability. Similarly Monk's study suggests that students' exposure to books and the amount of reading they do are factors related to their achievement in written composition.

In addition to suggesting scope and direction for the present study, the above studies led the investigator to hypothesize that a measure of students' reading ability coupled with a measure of their reading habits would bear a significant relationship to students' skill in written composition. However, as was also noted, the studies reviewed clearly suggested that achievement in an area of the language arts can be affected by other factors. Three of these factors, sex, intelligence, and socioeconomic status, are now reviewed in the following section of this study.

II. OTHER FACTORS RELATED TO COMPOSITION

Sex Differences

McCarthy, following her comprehensive survey of the relevant literature on language development in children, concludes that there is a slight difference in favor of girls in nearly all aspects of language that have been studied. The girls' superiority shows itself in sentence length, vocabulary, articulation, comprehensibility, correctness, freedom from slang, and fluency.²⁰ McCarthy further states, that whenever groups of boys and girls are well matched in intelligence and socioeconomic background and when sex differences favoring the girls fail to appear, or when in rare instances are reversed, the results can nearly always be accounted for.²¹

With specific reference to sex differences in the ability to write, Stalnaker conducted a study of the results of the College Entrance Examination Board. 1940 examination in English. The examination, taken by a total of 6,057 male and female students, was entirely of the essay type, with all answers discursive. Stalnaker found that the girls secured higher scores than the boys on the English examination, although the superiority was not common to most of the board's other examinations. Even when controls were made on the type of school from which the candidates came, the ratings of the candidates on the Scholastic Aptitude

²⁰ Dorothea McCarthy, "Language Development in Children," A Manual of Child Psychology, Second Edition, Leonard Carmichael, editor (New York: John Wiley and Sons, Inc., 1954), pp. 576-581.

²¹ Ibid., p. 577.

Test, and the location of the school attended, the differences in favor of the girls still persisted.²²

Studies conducted in Alberta also have shown that boys lag behind girls in their ability to write. Sly, following an analysis of a series of tests given in the Clover Bar School Division, concluded that in essay writing (STEP Essay) the girls were significantly superior to the boys in every grade from four to twelve. The girls were also found to be superior in mechanics of language (STEP Writing) in all grades from four to twelve, falling short of significance only in grade nine.²³ A similar finding was reported by McKie who, while studying the free essay writing of boys and girls in grades four, five and six, reported significant differences favoring the girls.²⁴

Other studies, particularly those of Stroud and Lindquist,²⁵ and Traxler and Spaulding,²⁶ in addition to showing that there are sex differences in the ability to write, have attempted to find reasons for this sex difference in language ability. They have tended to in-

²² John M. Stalnaker, "Sex Differences in the Ability to Write," School and Society, LIV (December, 1941), pp. 532-535.

²³ H. F. Sly, "An Analysis of Sex Differences in an Alberta School Population," (Unpublished Ed. D. thesis, The University of Alberta. Edmonton, 1960), p. 121.

²⁴ F. I. McKie, "An Analysis of Free-Writing by Grade Four, Five, and Six Students". (unpublished M. Ed. thesis, The University of Alberta, Edmonton. 1963), p. 95.

²⁵ J. B. Stroud and E. F. Lindquist, "Sex Differences in Achievement in Elementary and Secondary Schools," The Journal of Educational Psychology, XXXIII (December, 1942), pp. 657-667.

²⁶ A. E. Traxler and G. Spaulding, "Sex Differences in Achievement of Independent School pupils as Measured by Standard Achievement Test, Form K," Education Record Bulletin, 63 (1954), pp. 69-80.

dicade that there exists in girls a biologically based tendency toward a social orientation and communication which is greater than that found in boys.²⁷

Socioeconomic Differences

There is considerable evidence in the literature to indicate that in the elementary school years there exists a marked relationship between the socioeconomic status of the family and the child's language development. Loban's report of his longitudinal study, "A Study of the Use and Control of Language Effectiveness in Communication, and the Relations among Speaking, Reading, Writing, and Listening,"²⁸ supports this contention. The Loban project, which began in September 1952, deals with the development of language ability of 338 children in eleven kindergarten classes from socioeconomically diverse districts in Oakland, California.

In one aspect of this project Loban collected written language samples (a written response to a coloured picture) of these students as they were in grades four, five, and six and noted the students' writing proficiency in relation to the socioeconomic status of their families. As a measure of socioeconomic status he classified the occupations of both parents according to the Minnesota Scale for Paternal Occupations. The

²⁷

Sly, loc. cit.

²⁸

W. D. Loban, The Language of Elementary School Children. (NCTE Research Report No. 1. National Council of Teachers of English. Champaign, Illinois, 1963).

subjects were ranked in the following categories of paternal occupation:²⁹

- I Professional
- II Semiprofessional
- III Clerical, Skilled Trades, Retail Business
- IV Farming
- V Semiskilled Occupations
- VI Slightly Skilled Trades
- VII Day Labor

Loban found that for the students in each of the categories, the results were as follows:³⁰

WRITING PROFICIENCY IN RELATION TO SOCIOECONOMIC STATUS

Socioeconomic Category	Median Rating on Writing (Grades Four, Five, and Six Combined)
I	Average
II	Average
III	Average
IV	Below Average
V	Below Average
VI	Below Average
VII	Below Average

Other research studies have also shown that a positive correlation exists between the socioeconomic status of the family and the quality of a student's written composition. Monk examined the achievement of seven hundred grade seven pupils in Burnaby, British Columbia, and then sought to ascertain which environmental factors are associated with students' proficiency in writing. He found that where the father was regularly employed in a business, managerial or professional capacity, achievement tended to be high, and that, in general, the home life of

²⁹ Ibid., pp. 26-27.

³⁰ Ibid., p. 57.

superior writers was well ordered and the family relationships close.³¹

A further study, of particular interest for its concern with socioeconomic status, was conducted by McClellan who, using two hundred papers randomly selected from those of 1,065 children in grades three through six, conducted a study on creative writing. The two hundred students attended three schools, representative of the upper, middle, and lower economic classes. McClellan found that, with almost every factor studied, the higher the socioeconomic level the better the performance.³²

The aforementioned studies of Loban, Monk, and McClellan have shown that a persistently parallel variation of language proficiency and socioeconomic status exists for children in the elementary school. As Loban states, "It appears entirely possible that language proficiency may be culturally as well as individually determined."³³

Also, "if children reared in families at the least favored socioeconomic positions receive a restricted language experience, if their early linguistic environment stresses only limited features of language potential, such children may indeed be at a disadvantage in school and in the world beyond school."³⁴ Again, as Meckel, in his essay, "Research on Teaching Composition and Literature," states, "Children from families of upper socioeconomic status have been found to have linguistic

31 Monk, op. cit., p. 1619.

32 Braddock, op. cit., p. 30.

33 Loban, op. cit., p. 89.

34 Ibid.

advantages over children from lower social class groups with respect to vocabulary, writing, sentence structure. and usage (supported by E. A. Davis, 1937; Day, 1932; Lloyd and Warfel, 1956; McCarthy, 1954)."³⁵

With the exception of a study by Donelson to determine the "Variables Discriminating between Effective Writers and Ineffective Writers at the Tenth Grade Level," the present investigator had difficulty in locating studies specifically concerned with socio-economic status and composition ability of secondary school pupils. Donelson studied six selected variables to determine their discriminating power between 124 effective writers and 127 ineffective writers at Cedar Rapids, Iowa. Of particular interest were his findings related to the variable, "parents, home, and family". The significant differentiating factors for this variable were:

Education of father ($C = .380$) and mother ($C = .356$); socioeconomic status, as determined by father's job on the Warner Scale ($C = .384$); amount of father's reading ($C = .275$); reading of foreign language by the mother ($C = .269$); number of magazines in the home ($C = .376$); and type of records in the home ($C = .263$).³⁶

Intelligence Differences

Hunt has very clearly developed the position that intelligence

³⁵ H. C. Meckel, "Research on Teaching Composition and Literature," in N. L. Gage, Handbook of Research on Teaching (Chicago: Rand McNally Company, 1963), p. 970.

³⁶ K. L. Donelson, "Variables Discriminating Between Effective and Ineffective Writers at the Tenth Grade Level," (Doctor's thesis, Iowa: State University of Iowa, 1963). Abstracts: Dissertation Abstracts, XXIV (January, 1964), p. 2735.

is not primarily a genetically determined entity but rather a function which develops in and through the process of interaction with the environment.³⁷ Investigators, for some time, have been aware of this relationship and pointed out the "middle class" bias in many existing intelligence tests.³⁸ Eells spoke of the cultural bias of intelligence tests and noted that children from deprived backgrounds often receive scores which are not an accurate reflection of their basic intelligence.³⁹ In interpreting the results of the following studies pertaining to the relationship of students' intelligence to their writing ability one must be aware of the relationship between intelligence and socioeconomic status.

Lorge and Kruglove point out that it is to be expected that the quality of a person's written expression would reflect his intellectual ability, since the ability to understand written passages, to perceive relationships and common principles, and to organize new materials are all considered aspects of intellectual ability and are also needed to write well. They further point out that intellectual ability is reflected in writing ability through the high correlation between vocabulary tests and measures of intelligence, since the writing of compositions involves the ability to organize thoughts through the

³⁷ Joseph Hunt, Intelligence and Experience (New York: Ronald Press Company, 1961).

³⁸ Allison Davis, Social Class Influences on Learning (Cambridge: Harvard University Press, 1957), pp. 59-88.

³⁹ Kenneth Eells, "Some Implications for School Practices of the Chicago Studies of Cultural Bias in Intelligence Tests," Harvard Educational Review, 23 (Fall, 1953), pp. 284-297.

medium of vocabulary.⁴⁰ Reed states that "We should judge intelligence the most important single factor of ability in written composition. This is especially true in so far as the quality of composition depends upon clearness and coherence."⁴¹

In general, the conclusion that a correlation exists between intelligence and written composition is verified by other studies. Lyman reports of a study by Lockwood who found that the correlation between composition scores (Hudelson scale) and the general intelligence (Otis test) of fifty-four boys was $.67_{-}^{+}$.05 and of fifty-three girls, $.76_{-}^{+}$.04.⁴² Sangren working with ninth grade pupils similarly concluded that a high degree of intelligence is correlated with the ability to write well.⁴³ More recently, Donelson found that intelligence as measured by the Otis test had a correlation of .681 with written composition for one hundred twenty-four effective writers and one hundred twenty-seven ineffective writers from three high schools in Cedar Rapids, Iowa.⁴⁴

⁴⁰ I. Lorge, and L. Kruglove, "The Readability of Pupil Composition and Their Measured Intelligence," Journal of Educational Research, XLIII (February, 1950), pp. 467-474.

⁴¹ Homer B. Reed, Psychology of Elementary School Subjects (Boston: Ginn and Company, 1938), p. 180.

⁴² R. L. Lyman, Summary of Investigations Relating to Grammar, Language and Composition (Chicago: The University of Chicago, 1929), p. 175.

⁴³ P. V. Sangren, "Intelligence Tests and the Classification of Students in Ninth-Grade English," Educational Administration and Supervision, IX (December, 1923), pp. 547-553.

⁴⁴ Donelson, op. cit., p. 2735.

Conclusion

Composition ability has been shown by various investigators to be related to each of three important factors: sex, socioeconomic status of the family, and the intelligence of the students. It is apparent, therefore, that any study of students' ability in written composition must be conducted so that these factors are taken into account.

CHAPTER III

DESIGN OF THE STUDY

I. SAMPLE

A method of purposive sampling was employed in the selection of the sample, since a preliminary investigation of the high schools in Edmonton revealed that one high school in particular would provide students with an adequate range of socioeconomic scores, reading ability scores, intelligence scores, and composition scores. Therefore, the grade ten population from one large high school within the city of Edmonton, Alberta, a city with a population in excess of 300,000, was chosen.

The sample chosen consisted of 147 grade ten students (80 male students and 67 female students) who comprised the enrolment of six of the nineteen classes of grade ten students within the school. Since the school employed heterogeneous grouping, the six classes were selected in such a manner as to keep the teacher variable to a minimum of two teachers. The 147 students selected were taught by two teachers, each teacher teaching three classes. Other defining properties of the sample are shown in Table I.

These defining properties should be carefully considered before any generalizations are made. In fact, some researchers assert that unless random sampling methods are used, there is absolutely no basis for the use of inferential processes.¹ However, others state that

¹ A. Stuart, Basic Ideas of Scientific Sampling, (London: Charles Griffin, 1962)

TABLE I

RANGES, MEANS, AND STANDARD DEVIATIONS
FOR 147 STUDENTS ON THE CRITERION
VARIABLE AND FOUR PREDICTOR VARIABLES

Variable	Range	Mean	Standard Deviation
Composition	2 - 12	7.22	1.96
Intelligence	84 - 151	110.29	12.04
Socioeconomic Status	14 - 98	50.06	18.25
Vocabulary	15 - 56	38.69	7.79
Reading Comprehension	5 - 59	38.68	11.85

"random sampling formulas apply more or less accurately to purposive samples".² To justify the application of statistical tests of significance to data from non-probability samples, investigators "postulate hypothetical populations of which the study samples are, to all intents and purposes, probability samples."³

To apply statistical tests of significance for the evaluation of the findings, the sample in this study will be considered as a probability sample of a hypothetical population.

II. TEST INSTRUMENTS

The investigation required the use of two main tests:

1. an Essay Test to measure composition ability; and
2. a Reading Test which, through the use of a vocabulary test and a reading comprehension test, would gauge students' reading ability.

Also it was necessary to obtain:

1. through the use of a questionnaire, the reading habits of the students;
2. a measure of the socioeconomic level of the family; and
3. from the school records, a measure of the students' intelligence.

Essay Test

The Essay Test used in this investigation was the Cooperative Sequential Tests of Educational Progress: Essay Test, Form

² H. E. Garrett, Statistics in Psychology and Education, (New York: Longmans, Green, 1960), p. 207.

³ M. Selltiz, M. Jahoda, M. Deutsch, and S. W. Cook, Research Methods in Social Relations, (New York: Holt, Rinehart and Winston, 1963). p. 542.

2A,⁴ i.e. the STEP Essay. This test is a free-response test of writing ability. The student is presented with a brief paragraph setting forth a topic on which he is to write. He is given thirty-five minutes to read the paragraph and to plan and execute his response.

Difficulties in Scoring Essay Tests. One of the fundamental problems in research into written composition is the general evaluation of actual writing. Variables such as the writer variable, the assignment variable, and the rater variable have to be considered.

The Writer Variable. Many researchers purporting to measure writing ability actually only measure a student's performance on a given topic on a given day. The student is subject to a broad but finite range of distractions; he may suffer from personal concerns or from annoyances within the examination room. Thus, one is faced with the question of determining whether the student is fully using his ability to write. Braddock, Lloyd-Jones, and Schoer suggest that if a person's writing performance is consistently low one may then conclude that the student has demonstrated poor ability. However, Braddock, et al, hasten to add that one cannot say positively that the student has poor ability; "perhaps the student has latent writing powers which can be evoked by the right instruction, the appropriate topic, or the genuine need for effective writing in the student's own life."⁵

⁴ Cooperative Test Division, Cooperative Sequential Tests of Educational Progress, Essay Test, Form 2A (Princeton, New Jersey: Educational Testing Service, 1957). Appendix A.

⁵ R. Braddock, R. Lloyd-Jones, and J. H. Ward, Research in Written Composition, (Illinois: Champaign, National Council of Teachers of English, 1963) p. 6.

Kincaid, in his study, "Some Factors Affecting Variations in the Quality of Students' Writing," concluded "that a single paper, written by a student on a given topic cannot be considered as a valid basis for evaluating his achievement in a writing course at any time, unless that student's writing ability was rather low; and, even then a single paper would not provide an infallible basis for such an evaluation." Kincaid found that an individual's daily writing performance varies, especially the performance of better writers.⁶ Similarly, Anderson found that seventy-one percent of the fifty-five eighth grade students he examined on eight different occasions "showed evidence of composition fluctuation" apart from the discrepancies attributable to the raters.⁷ The studies of Kincaid and of Anderson point clearly to the existence of a writer variable.

However, for this investigation it was not possible to arrange another testing occasion to enable the students to write twice on the same essay topic. The investigator assumed that with a large sample (N = 147) the variations in the day to day writing performances of individual students would "cancel each other out". But, as Braddock points out, "this assumption is false if Kincaid's finding is true that the performance of good writers varies more than the performance of poor writers; the mean rating of the single papers from each of the good writers would not reflect their typically good writing as closely

⁶ Ibid., p. 92.

⁷ C. C. Anderson, "The New STEP Essay as a Measure of Composition Ability," Educational and Psychological Measurement, XX (Spring, 1960), pp. 95-96.

as the mean rating of single papers from poor writers would reflect their typically good writing."⁸

The Assignment Variable. Research studies concerned with the nature of the assigned essay topic inevitably point to the importance of selecting topics with care. The College Entrance Examination Board suggests that a single topic should be used, thus controlling the effects of the topic on the quality of writing. The topic should be selected only after careful consideration is given to the topic's abstractness, familiarity, or interest to the entire group of examinees. Diederich suggests that the topic assigned must be within the students' comprehension because:

Even the better students write badly when the topic is beyond them. Their struggles are apparent, not only in lack of organization and in vagueness of statement, but in the very structure of their sentences. Their knowledge of grammar, punctuation, etc., seem to desert them when they are labouring with an idea which is too big for them.⁹

Thus, the proper adjustment of the topic to the ability of the students determines to a large extent the success of the research.

The Rater Variable. The existence of inter-rater variation in composition marking has been substantiated frequently by research. Investigations summarized by Ross and Stanley point out that beginning about 1910 several studies revealed that the marks received by students on compositions were more often a function of the personality of the rater than of the performance of the student. The following is an example

⁸ Braddock, op. cit., p. 7.

⁹ Paul B. Diederich, "The Measurement of Skill in Writing," School Review, LIV (December, 1946), p. 585.

of the investigations summarized by Ross and Stanley:

One of the most spectacular studies was made by Falls who had one hundred English Teachers mark a composition by assigning a percentage value and also indicating the school grade in which they would expect the quality of the work to be done....The percentage values varied from 60 to 98 and the estimated grade location from the fifth grade to the junior year of college...¹⁰

Certainly it is true that disagreement among theme-graders is common. Perhaps the clearest testimony of this unreliability, as reported by Braddock, was developed in a study by Diederich and two colleagues:

They analyzed the way ten English teachers rated three hundred two-hour compositions by college freshmen in comparison to forty-three other raters: social scientists, natural scientists, writers and editors, lawyers and business executives. The raters were given no standards or criteria for judging the papers, they were merely asked to sort the themes into nine piles in order of general merit, with not less than four percent of the papers in any pile. It was disturbing to find that 94 percent of the papers received seven, eight, or nine of the possible grades, and that the median correlation between readers was .31. Readers in each field, however, agreed slightly better with the English teachers than with one another.¹¹

Despite the many studies that have shown variation in marks awarded by different examiners, sceptics about the reliability of marking must applaud Eeley's contention:

There is no doubt that from some points of view we could find reasons for abandoning forever the essay test. Unfortunately, the corollary to this action is the decline in the art of the teaching of writing. This is a serious consequence both for the individual and for our society. The ability to use language creatively is one of the last strongholds of the individual against a growing

¹⁰ C. C. Ross, and J. C. Stanley, Measurement in Today's Schools (New York: Prentice Hall, 1954), p. 41.

¹¹ Braddock, op. cit., p. 41.

tendency towards conformity.¹²

If there were no more encouraging results than those summarized above, any experiment designed to measure students' skill in written composition would appear to be impractical because of the markers' inability to discriminate consistently. Fortunately, other articles discussing the grading of essays are less pessimistic.

When researchers have taken time to devise ways to mitigate the subjectivity and to reduce some of the biases that occur in evaluating essays the unreliability of scores can be decreased appreciably. With raters using a common set of criteria, Buxton reported reader reliability coefficients of .91 and .88, and Kincaid obtained reliabilities ranging from .77 to .91.¹³ Finlayson in his study, "The Reliability of the Marking of Essays," found reliabilities ranging from .79 to .96 in the rating of one-hour papers written by 850 sixth graders in twenty-one primary schools.¹⁴ It seems clear, then, that high reader reliabilities are possible when carefully defined criteria are followed.

Scoring the STEP Essay in this Investigation. In this study efforts were directed toward reducing the unreliability of the scoring of essays by adopting the following marking procedure:

1. The essays were numbered from 1 to 147.
2. The 147 essays were placed in random order and were marked accordingly.

¹² E. G. Eeley, "The Test Satisfies an Educational Need," College Board Review, XXV (1955), p. 13.

¹³ Braddock, op. cit., p. 42.

¹⁴ Ibid.

3. The rating procedures were thoroughly discussed by the two markers, especially with respect to "quality of thought," "style," and "conventions". Ten essays, not used in the investigation, provided practice material for the markers. These essays were discussed thoroughly, differences between grades given by markers were noted, and agreement was reached on all major points.
4. Each rater read and graded the essays separately from the other rater and worked independently from the other. However, with every fifteenth paper the raters discussed the scores they had given for that essay. The scores already given for that essay were not altered, but the discussions served to insure that both raters would attempt to continue to give the same marks for the same qualities. This procedure was used as a check against changing standards that might result from boredom of the markers, the repetition of the same device or idea in many papers, or a gradual - and perhaps unconscious - relaxation of standards when few papers appear to meet the requirements set.
5. The two grades were combined to give the total essay score.
6. Two weeks after the first reading the raters regraded twenty of the essays. The papers chosen were 7, 14, 21 140.

Raters scored the essays on the basis of criteria recommended in the Handbook for Essay Test: Level 2. The criteria were three broad factors, weighted as follows:¹⁵

Quality of thought	50%
Style	30%
Conventions	20%

"Quality of thought" was defined as "the selection and the adequacy of ideas and supplementary details, and the manner of their organization (i. e. the way in which their connections are derived from the arrangement of parts)."

"Style" was defined as "clearness, effectiveness, and approp-

¹⁵ Educational Testing Service, Handbook for Essay Test: Level 2. (Princeton, New Jersey: Educational Testing Service, 1957), p. 5.

riatness, including matters of structure and diction, emphasis, the means of transition between ideas, and the finer points of simplicity, economy, variety, and the exactness of expression."

"Conventions" was defined as "the proprieties of mechanical form, including grammar and usage, capitalization, punctuation, and the mechanical aspects of the structure of sentences."

Scoring was principally a matter of matching students' essays with model comparison essays. Seven ratings were used, with comparison essays furnished for three of the ratings - ratings 2, 4, and 6. With the procedure of using comparison essays at only three levels, a score of seven was awarded to a paper clearly superior to comparison essay six, and a score of one was awarded to an essay clearly poorer than comparison essay two. Scores of five mean that essays were not quite up to the mark six, but distinctly better than the sample rating four.

Figure I shows the distribution of grades assigned by the two raters. The Pearson product moment correlation for the 147 essays was 0.66.

Validity of STEP Essay. Research has shown that samples of writing done over a semester are a better index of students' writing ability than a single essay written at a specific time. Often, however, different samples are not available and one has to estimate students' composition ability by attempting to evaluate one sample of that ability. Diederich maintains that:

The validity of such a test can be questioned only if the students are required to write a paper extremely unlike the writing they will have to do in the normal course of events or if the papers are marked chiefly for their content; that is for the accuracy and completeness of the writers' know-

Grades
for
Marker
One

7							
6				3	4	3	
5			1	6	8	1	
4			7	25	9	1	
3		5	21	18	3	1	
2		6	15	6			
1		4					
	1	2	3	4	5	6	7

Grades for Marker Two

FIGURE I

STEP ESSAY TEST: BIVARIATE FREQUENCY DISTRIBUTION
OF THE GRADES OF TWO MARKERS

ledge of the subject assigned. If these two mistakes are avoided, the essay is unquestionably a valid test of ability to write, for it is an instance, a sample, of the very ability that one is attempting to measure. There is no more direct evidence of ability to write.¹⁶

The use of the STEP Essay in this investigation and the manner of administering the test were similar to the testing procedures followed in the school. Furthermore the essay topic chosen was well within the students' comprehension. In addition, the formulators of the STEP Essay test, relying on the knowledge of "expert teachers and supervisors of English", maintain that the topics are chosen so as to take into account socioeconomic, regional, cultural, and religious differences.¹⁷

Reliability of STEP Essay. As outlined in the section, "Difficulties of Scoring Essay Tests," of this investigation, it is extremely difficult to arrive at a reliable estimate of students' essay writing ability. Anderson has listed four main difficulties:

1. unrepresentative sample topic;
2. fluctuating performance;
3. variability among markers; and
4. inconsistency of the individual marker.¹⁸

However, it is just such difficulties as these that the STEP Essay is designed to overcome (or minimize), particularly if the marking procedure described above is followed.

With respect to inter-rater reliability (that is, how con-

¹⁶ Diederich, op. cit., p. 584.

¹⁷ Cooperative Test Division, Handbook for Essay Test: Level 2. (Princeton, New Jersey: Educational Testing Service, 1957). p. 5.

¹⁸ Anderson, op. cit., pp. 95-96.

sistent are readers in their rating of the same paper) the publishers report that for Test Level 2, Form A, an r of 0.68 was obtained by judges marking 376 essays.¹⁹ Black administered the same test to 246 students in the Clover Bar School Division, Alberta, and obtained an inter-rater reliability of 0.82. Black states that "It stands to the publisher's credit that the scoring procedures if adhered to, are effective and comparable to the efforts of highly trained readers."²⁰ Wardaugh, in his use of the STEP Essay, Level 2, Form A, with 120 senior high school students in Edmonton, Alberta, obtained a Pearson product-moment correlation of 0.62 for his two raters. He found a reliability of 0.77 for Marker One and for Marker Two, 0.73.²¹

Table II shows, for this investigation, the grades assigned in the reliability procedure. For Marker One the intra-rater reliability was 0.71; for Marker Two it was 0.84. It is also apparent that there was greater consistency within the individual rater than agreement between the raters. One also notes that the correlation for the twenty essays on the first occasion of marking was 0.67 and on the second, 0.71.

Reading Test

Structure of the Cooperative English Reading Comprehension Test.

The Cooperative English Reading Comprehension Test²² is divided into two

¹⁹ Cooperative Test Division, op. cit., p. 29.

²⁰ Donald B. Black, "A Note on the Use in Alberta of Sequential Tests of Educational Progress: Essay Test," Alberta Journal of Educational Research, 4 (September, 1958), p. 179.

²¹ R. Wardaugh, "Uses of a Transformational Grammar Test," (unpublished Ph. D. Dissertation, The University of Alberta, 1961), p. 70.

²² Cooperative Test Division, Cooperative English Tests: Reading Comprehension, Form 2 A, (Princeton, New Jersey: Educational Testing Service:1960).

TABLE II
STEP ESSAY TEST RELIABILITY: GRADES
AND CORRELATIONS

Essay	Marker One		Marker Two	
	First Assigned Grade	Second Assigned Grade	First Assigned Grade	Second Assigned Grade
	1	2	3	4
60	4	3	4	4
104	3	2	5	4
17	2	2	2	2
112	4	3	4	5
54	2	2	3	2
93	6	5	6	6
3	2	2	3	2
26	3	3	3	4
28	2	2	3	3
38	3	2	3	2
70	4	2	3	3
124	6	4	4	3
94	4	4	5	5
107	4	3	5	4
137	4	3	5	5
125	4	5	5	5
154	3	3	4	4
19	3	4	4	4
64	4	3	4	4
4	3	3	4	4

Correlations (r): 1 and 2: 0.71
 3 and 4: 0.84
 1 and 3: 0.67
 2 and 4: 0.70

parts: Part I is a Vocabulary Test and, Part II, a Reading Test.

In Part I the student is asked to look at a word and to choose from a list of four words or phrases below it, the one which most nearly approximates the same meaning. The items range in difficulty from easy words with widely divergent choices to difficult words with choices separated only very slightly in meaning. The raw score is simply the number of items right out of sixty.

Part II consists of a Reading Comprehension Test which is itself divided into two sections, one representing the student's Level of Comprehension and the second his Speed of Comprehension. The Level of Comprehension raw score is the number of items the student answers correctly out of the first thirty items in Part II. The Speed of Comprehension score is based on the number of items the student answers correctly out of all sixty items in Part II. The score is dependent on how fast the student can read the passages with understanding and answer the questions.

The reading passages are varied in style and content, so that they represent the many kinds of experiences which the student is called upon to read in school. The questions on each passage range from those requiring the student to recall a "fact" of the passage to increasingly complex questions requiring him to interpret what he has read. For each question the student chooses the best of four completions presented.

As shown in Table III a study of the intercorrelations between the three part scores of the Cooperative Reading Comprehension Test obtained in this study indicates that Level of Comprehension and Speed of Comprehension measure closely related abilities. Thus, for this study, the student's Level of Comprehension score was not considered

separately. The student's Speed of Comprehension score, which represents the rate at which an individual has attempted to comprehend the test material and his success in comprehending it, was used.

TABLE III

INTERCORRELATIONS OF THE THREE PART SCORES
OF THE COOPERATIVE READING COMPREHENSION TEST

	Level of Comprehension	Speed of Comprehension
Vocabulary	0.67	0.73
Level of Comprehension		0.81

Validity. The validity of a reading test is determined by the extent to which the test measures the skills actually involved in the reading process. The publishers claim that content validity is best insured by relying on "well-qualified people" to first make a thorough analysis of the reading process and then to construct items to measure the identified skills. This process was followed by the Cooperative Test Division in constructing the Cooperative English Reading Comprehension Test. It should be noted that the present Cooperative English Reading Comprehension Test was constructed (revised) in 1960 and thus very few studies are available which make specific reference to the test's validity. Fleming, in his review in The Sixth Mental Measurements Yearbook, points out that during the period Cooperative English Tests have been in use they have undergone substantial revisions and a great deal of back ground and interpretative information has been accumulated.²³ In the Technical Report the publishers provide the results of eighteen studies

concerned with the predictive validity of earlier forms of the Reading Comprehension Test. One such study reported is that by Traxler. Using teacher's ratings of reading ability as the criterion measure, Traxler found the predictive validity coefficients of the Reading Comprehension sub-tests to be as follows: Vocabulary, 0.57; Speed of Comprehension, 0.56; and Total Reading Comprehension, 0.61. These coefficients were obtained for 115 eleventh grade students. Although these studies are based on earlier editions of the test, the present test is enough like the former editions, that the findings may be considered relevant.²⁴

Reliability. The publishers in the Technical Report accompanying the Cooperative English Reading Comprehension Test report the following reliability coefficients between parallel forms (Form 2 A and Form 2 B) of the Reading Comprehension Test with 780 grade ten students: Vocabulary, 0.89; Level of Comprehension, 0.78; Speed of Comprehension, 0.87; and Total Reading Comprehension, 0.94.²⁵

Questionnaire on Reading Habits

To aid in the construction of a questionnaire to assess the students' reading habits, procedures followed by other investigators who have used the normative survey were carefully examined. Since the

²³ W. G. Fleming, "Review of Reading Comprehension: Cooperative English Tests," in O.K. Buros, The Sixth Mental Measurements Yearbook (Highland Park: New Jersey: The Gryphon Press, 1965), p. 806.

²⁴ Cooperative Test Division, Cooperative English Test: Technical Report (Princeton, New Jersey: Educational Testing Service, 1960), pp. 13-17.

²⁵ Cooperative Test Division, op. cit., p. 19.

studies of Fisk and Campbell²⁶ and Brett²⁸ were closely related to this aspect of the present investigation, the general format of their instruments was adopted with a few changes. A copy of the instrument appears in Appendix D.

The major areas of investigation were:

1. The number of books in students' homes and the number of books students read.
2. The extent to which students enjoyed reading and the time they did most of their reading.
3. The students' general reading interests: fact, fiction, prose, plays, essays, poetry, newspapers, and magazines.
4. The number of magazines and newspapers students read and their frequency in reading these.

Intelligence

Intelligence scores as determined by The Henmon-Nelson Test of Mental Ability (for Grades 9-12) were used in this study. This Test was selected since the scores were readily available from the students' cumulative records. The Henmon-Nelson Test of Mental Ability consisting of 90 five-choice items is best described as a test of general intelligence.

Socioeconomic Status

Sociologists rarely agree about the precise meaning of the term "social status". In recent years it has been generally agreed that a combination of factors such as activities, occupation, and material

²⁶ Robert R. Fisk, "A Survey of Leisure Reading in the Junior High Schools of Alberta." Unpublished Master's Thesis, University of Alberta, 1961.

²⁷ Charles S. Campbell, "Leisure Reading in the Senior High Schools of Alberta." Unpublished Master's Thesis, University of Alberta, 1962.

²⁸ Betty M. Brett, "A survey of the Leisure Reading of Grade Nine Students in Central High Schools of Newfoundland." Unpublished Master's Thesis, University of Alberta, 1964.

wealth establishes one's socioeconomic level.

A number of objective scales are available for ascertaining status. Some, like the Chaplin scale, depend upon ratings given to the home by a visitor; others, like the Barr, Blishen, Goodenough, or the Taussig, are based upon weights assigned to occupational categories. Instruments like the American Home Scale and the Sims Score Cards represent a third kind of inventory; in these two scales the respondents answer a series of questions about their home, material possessions and social participation.²⁹

Blishen Occupational Class Scale. Following the work of earlier researchers with occupational measures, Blishen developed an occupational scale suitable for use in Canada. On the basis of national census data Blishen selected 343 occupations, calculated their mean income and the average number of years of schooling required, and then computed the standard scores of these two measures. These two standard scores were then combined and ranked according to the combined score to form the Canadian Occupational Scale - a scale ranging from 32 (hunters and trappers) to 90 (judges) with a mean of approximately 50 and a standard deviation of 10. According to Blishen this scale appears to give predominant weight to the amount of responsibility involved and the degree of training required.³⁰

²⁹ H. Gough, "A Short Social Status Inventory." Journal of Educational Psychology, 40 (1949), p. 52.

³⁰ Bernard R. Blishen, "The Construction and Use of an Occupational Class Scale," Canadian Journal of Economics and Political Science, 24 (1958), pp. 519-531.

Empirical justification for the use of such a scale is seen in the correlation of .94 between Blishen's Scale and Halt's "National Opinion Research Center Index". Moreover, Blishen found a mean correlation of 0.85 between his Canadian index and similar scales standardized in Great Britain, New Zealand, Japan, and Germany by a variety of other methods.³¹

Home Index Scale. Many researchers have suggested that occupation is only one of the factors contributing to social prestige. Gough produced a new "Home Index" scale "based largely upon a re-analysis and re-working of items in the Simms Score Cards, and the American Home Scale, with the addition of certain original items. This new index correlated 0.88 and 0.82 with the two scales on which it was based, and 0.65 with a measure of occupational status."³²

Elley adopted the Gough scale for use in his 1961 study, in order to supplement the occupational index. The final Home Index Scale, containing fourteen points from the original Gough Scale and six new ones, is based on a total of twenty points. Elley calculated the reliability coefficient for the modified scale using the split-half method and found it to be 0.77 on his Edmonton sample (N = 4327). He found also that the new Home Index Scale correlated 0.61 with Blishen's Occupational Scale.³³

For the purposes of this study a socioeconomic classification was made using both the Blishen Occupational Class Scale and the Home Index Scale as modified by Elley. By combining the two scales, with

³¹ W. B. Elley, "A Comparative Analysis of the Socioeconomic Bias in Selected Intelligence Tests," (unpublished Ph.D. dissertation, The University of Alberta, 1961), p. 57.

³² Gough, op. cit., p. 53.

³³ Elley, op. cit., p. 104.

equal weightings given to both, it was hoped to establish more accurately the socioeconomic level of the child's family. Table IV shows the ranges, means, standard deviations and the Pearson product-moment correlation of the two scales as used in this investigation.

TABLE IV

RANGES, MEANS, STANDARD DEVIATIONS, AND
CORRELATION COEFFICIENT OF THE HOME INDEX
SCALE AND THE BLISHEN OCCUPATIONAL CLASS SCALE

	Home Index	Blishen
Range	4 - 19	32.0-81.2
Mean	11.95	51.00
Standard deviation	3.29	9.23
Correlation coefficient	0.67	

III. TEST ADMINISTRATION

All tests and questionnaires were administered to the six grade ten classes during successive fifty-two minute English class periods. A total of three days was used testing, with two periods for each class. Testing was done during the third week of May, 1966. The tests were administered in the following order:

First English Period

STEP Essay Test (35 minutes)

Questionnaire on Reading Habits (10 minutes)

Second English Period

Cooperative Reading Comprehension Test (40 minutes)

Home Index Scale

Blishen Occupational Class Scale (10 minutes)

IV. TREATMENT OF DATA

Multiple Linear Regression

The major analysis in this study utilized Applied Multiple Linear Regression Analysis, a statistical technique developed by Bottenberg and Ward of the Lackland Air Force Base, Texas. This technique, involving vector operations in place of traditional summation operations, is recognized as a powerful tool for investigating relationships between a set of independent variables (predictors) and a dependent variable (criterion).³⁴

One of the faults, it seems, of many studies dealing with composition, is that they do not have sufficient control on variables which are related to the criterion variable. Experimentally, one is able to control the effects of salient variables by matching subjects on these variables and testing the effect of the independent variable under consideration. Statistically, the same end is attained, in this study, by the use of multiple linear regression.

Multiple linear regression, as its main assumption, assumes that between a set of n predictors $X(i)$, $i = 1$ to n , and a criterion Y there exists a linear relationship.^{35,36} The analysis does not necessitate normality of distribution of predictor variables.

³⁴ Joe H. Ward, Jr., "Multiple Linear Regression Models," Computer Applications in the Behavioral Sciences, Harold Borko (ed.) (Englewood Cliffs, N. J.: Prentice-Hall, inc., 1962), pp. 205-207.

³⁵ Ibid. pp. 207-236.

³⁶ Robert A. Bottenberg and Joe H. Ward, Jr., Applied Multiple Linear Regression, Clearinghouse for Federal Scientific and Technical Information. U. S. Department of Commerce, Technical Documentary Report PRL-TDR-63-6 (Washington: Government Printing Office, 1963).

As its title implies, applied multiple linear regression seeks only to clarify whether or not a critical variable, when added to a linear expression, significantly reduces the criterion error sum of squares. The general approach is to express a vector of criterion variable data as a linear combination of a set of predictor vectors:

$$\hat{Y} = A_1X_1 + A_2X_2 + \dots + A_nX_n + E$$

where:

- Y is a vector of criterion variable data (N x 1)
- X(i) are vectors of predictor variable data (N x 1)
- A(i) are unknown weights associated with the predictor vectors
- E is an error or residual vector
- N is the number of observations

The problem is to find a set of weights ("least square weights") which minimize the error sum of squares (ESS) between the predicted criterion, \hat{Y} , and the measured values of Y. The error sum of squares is calculated over the N individuals for whom scores are available, as follows:

$$ESS = \sum_{i=1}^N (Y_i - \hat{Y}_{1i})^2$$

The observed product moment correlation, R_1 , between Y and \hat{Y}_1 is a measure of the goodness of fit between observed and predicted values of the criterion. Its square, called the squared multiple correlation (RSQ), represents the proportion of the variance of criterion accounted for by the linear equation predicting \hat{Y}_1 , and called, say, Model 1.

To investigate, in the presence of other variables, the effect

of one particular variable, a new model, Model 2, is written. For example to test the effect of variable three $X(3)$, Model 2 is written such that:

$$\hat{Y}_2 = A_1X_1 + A_2X_2 + A_4X_4 + \dots + A_nX_n + E_2$$

This equation, since it restricts variable three, is called the restricted model, whereas, the equation using all the possible predictors for the study is referred to as the unrestricted (general) model. From the restricted model a squared multiple correlation (R_2^2), which will be less than or equal to R_1^2 , is calculated.

Thus the significance of the contribution of any one variable $X(i)$ in the presence of others can be tested by calculating an F ratio as follows:

$$F = \frac{(R_1^2 - R_2^2) / df_1}{(1 - R_1^2) / df_2}$$

where:

R_1^2 = the squared multiple correlation from the full model

R_2^2 = the squared multiple correlation from the restricted model

df_1 = $(m_1 - m_2)$ with m_1 being the number of unknown weights associated with the full model, and m_2 the number of unknown weights associated with the restricted model

df_2 = $(N - m_2)$, with N being the number of observations

In a similar manner, all n predictor variables of an experiment can be investigated.

At the University of Alberta, Edmonton, the IBM 7040 computing facility allows use of a simple and convenient program called PERSUB to do the necessary computation.³⁷ This program was used for the analysis of Hypotheses 1 and 2 in this study.

V. SIGNIFICANCE LEVEL

After a consideration of the relative seriousness of making Type I and Type II errors it was decided to use the 0.05 level of significance throughout this study. Furthermore, Selltiz et. al. point out that "in the social sciences, it is more or less conventional to reject the null hypothesis when the statistical analysis indicates that the observed difference would not occur more than five times out of 100 by chance alone."³⁸

³⁸Selltiz, et. al., op. cit., p. 418.

CHAPTER IV

RESULTS AND ANALYSIS

It was convenient to group the contents of this chapter into three sections, following the three groups of hypotheses. Hypotheses 1, 1 a, and 1 b postulated that the students' reading scores would contribute significantly to the variance of scores on the STEP Essay Test, while Hypotheses 2 a, 2 b, and 2 c postulated that the sex, socioeconomic, and teacher variables respectively would significantly contribute to the variance of the scores. Hypotheses 3 (a, b, c, d, e, f, g, h, and i) postulated that certain reading habits of the students would significantly discriminate among the three groups of writers, namely, effective writers, moderately effective writers, and ineffective writers.

Since the first two groups of hypotheses were tested by using the same statistical technique, the results in each case will be reported in a similar manner. This should facilitate interpretation and permit parsimonious presentation. The results of the tests on hypotheses one and two appear in Table V. It should be noted that the results of these tests for a particular variable have meaning only in the presence of the variables included in the regression equation.

Table VI shows the correlation matrix for the six variables with composition as the criterion variable. With a sample size of 147, a chosen alpha of 0.05 and 145 degrees of freedom a correlation of 0.16 was needed for significance. These correlations were used to determine the "least square weights" associated with the unrestricted and restricted models.

TABLE V

CONTRIBUTION OF VARIABLES
WITH COMPOSITION AS CRITERION

	Restriction	R_u^2	R_r^2	df	F-Ratio	Probability*
X(3)+(4)	Total Reading**	.42162	.34271	2/140	9.55	0.00013
X(3)	Vocabulary	.42162	.36257	1/140	14.29	0.00023
X(4)	Reading Comprehension	.42162	.42152	1/140	0.02	0.87649
X(1)	Intelligence	.42162	.40262	1/140	4.50	0.03372
X(2)	Socioeconomic Status	.42162	.41605	1/140	1.35	0.24764
X(5)	Sex	.42162	.33887	1/140	20.03	0.00002

REGRESSION EQUATION FOR UNRESTRICTED MODEL

$$Y = .033X(1) - .009X(2) + .093X(3) + .002X(4) + 1.667X(5) \\ + .287X(6)^{***} - .387$$

* Level of significance = .05

** The Total Reading restriction was obtained by simultaneously dropping out both components of reading, X(3) and X(4).

*** X(6) is the teacher variable, which was controlled by being inserted into the model. No hypothesis was formed on its contribution.

TABLE VI
INTERCORRELATIONS AMONG VARIABLES

N = 147

	1	2	3	4	5	6	7
Composition	1.00	0.49	0.08*	0.52	0.47	0.35	0.29
Intelligence		1.00	0.26	0.65	0.68	0.10*	0.31
Socioeconomic Status			1.00	0.34	0.25	-0.10*	-0.02*
Vocabulary				1.00	0.71	0.02*	0.25
Reading Comprehension					1.00	0.13*	0.23
Sex						1.00	0.18
Teacher							1.00

* Not significant

I. HYPOTHESES 1, 1A, 1B

Hypothesis 1

There will be a significant contribution to the variance of scores on the STEP Essay by the students' total reading ability scores on the Cooperative Reading Comprehension Test, in the presence of intelligence, socioeconomic status, sex, and the teacher variable.

For this hypothesis the regression equation for the restricted model (that is, restricting the sum of the vocabulary scores and the reading comprehension scores) was:

$$\hat{Y} = .071X_1 - .001X_2 + 1.128X_5 - .398X_6 - 1.257$$

The regression equation for the unrestricted model, the F value, and the actual probability are recorded in Table V.

As was postulated by this hypothesis, students' total reading scores contribute significantly to the variance of scores on the STEP Essay Test. The F. value, 9.55, is highly significant ($p = .00013$), which means that taking into account the correlations of intelligence, socioeconomic status, vocabulary, reading comprehension, sex of the pupil, and the teacher variable with the criterion variable and the intercorrelations of the predictor variables with one another, reading ability significantly contributes to the regression equation predicting students' composition scores. In other words, knowledge of the students' reading ability scores enables one to make a significantly better prediction of students' composition scores than one could make by just knowing intelligence scores, socioeconomic scores, the sex of the pupil, and the teacher by whom the students were taught.

Hypothesis 1 a

There will be a significant contribution to the variance of scores on the STEP Essay by the students' vocabulary scores on the Cooperative Reading Comprehension Test, in the presence of intelligence, socioeconomic status, sex, the teacher variable, and reading comprehension.

The Cooperative Reading Comprehension Test consisted of two main sections: (1) a test of vocabulary; and (2) a reading comprehension test. Hypothesis 1(a) was formulated to test whether vocabulary, as a sub-section of the reading test, contributed significantly, in the presence of the other variables, to the students' writing ability. The regression equation, derived from the appropriate restricted model, to test this hypothesis was:

$$\hat{Y} = .050X_1 - .003X_2 + .032X_4 + 1.084X_5 + .378X_6 - .101$$

Table V shows that the F value of 14.28, calculated between the unrestricted model and the restricted model which omitted the vocabulary scores, has a probability of $\leq .001$. The chances that a reduction in the error sum of squares of this magnitude would occur when there is no difference in the population are less than one in one thousand. On the basis of this analysis the hypothesis was accepted. Students' vocabulary scores contribute significantly to the variance of composition scores when cognizance has been taken of the effects of intelligence, socioeconomic status, sex, the teacher variable, and reading comprehension.

Hypothesis 1 b

There will be a significant contribution to the variance of scores on the STEP Essay by the students' reading comprehension scores on the Cooperative Reading Comprehension Test, in the presence of intelligence, socioeconomic status, sex, the teacher variable, and vocabulary scores.

The test of this hypothesis involved restricting variable four, X_4 , reading comprehension, from the unrestricted (general) model. The regression equation thus formed was:

$$\hat{Y} = .034X_1 - .008X_2 + .095X_3 + 1.171X_5 + .273X_6 - .455$$

As shown in Table V, Hypothesis 1(b) was not accepted. Reading Comprehension scores, as a sub-section of the total reading scores, do not contribute significantly to the variance of writing ability scores above that contributed by the other variables.

Since the reading comprehension score was itself a composite of two sub-scores, namely, level of comprehension and speed of comprehension, the contribution of its two component parts was tested for significance. Neither the level of comprehension nor the speed of comprehension was found to contribute significantly. However, with a correlation of 0.84 between the level of comprehension and speed of comprehension this was to be expected.

II. HYPOTHESES 2A, 2B, and 2C

Although this investigation was primarily concerned with the relationship between students' written composition ability and their reading ability and reading habits, it was nevertheless necessary to consider other variables which have been shown to be related to one's ability to write. Intelligence, socioeconomic status, and the sex of the pupil were selected as possible vitiating variables which either should be controlled or included in the analysis to give a less contaminated indication of the influence of the main predictor variable, reading ability. In addition, since the 147 pupils were taught written composition by only two teachers, 76 students by Teacher A and 71 by Teacher B, it was possible to insert this knowledge as a categorical vector into the experimental design and thus acknowledge the variance due to the teacher variable. However, there was no hypothesis made on

the relationship of the teacher variable to students' skill in written composition.

Hypotheses 2a, 2b, and 2c postulated that the variables of intelligence, socioeconomic status, and sex would contribute significantly to the variance of students' scores in written composition. Table V presents the contributions of these predictor variables, while Table VI shows their intercorrelations.

Hypothesis 2 a

There will be a significant contribution to the variance of scores on the STEP Essay by the students' intelligence scores, in the presence of socioeconomic status, sex, the teacher variable and the students' total reading scores.

To test this hypothesis the regression equation formulated from the restricted model was:

$$\hat{Y} = -.008X_2 + .108X_3 + .017X_4 + 1.185X_5 + .397X_6 + 2.047$$

As shown in Table V the obtained F ratio of 4.50 is significant at the .03 level, thus supporting the hypothesis. That is, students' intelligence scores reduce the criterion error sum of squares to the extent that such a reduction could occur by chance factors only three times in a hundred. Thus, in the presence of socioeconomic status, sex, the teacher variable, and the students' total reading score, the students' intelligence scores contribute significantly to the prediction of their composition scores.

Hypothesis 2b

There will be a significant contribution to the variance of scores on the STEP Essay by the students' socioeconomic scores, in the presence of intelligence, sex, the teacher variable, and the students' total reading scores.

The regression equation derived from the appropriate restricted model to test this hypothesis was:

$$\hat{Y} = .035X_2 + .087X_3 + .002X_4 + 1.207X_5 + .304X_6 - .466$$

As shown in Table V the probability of getting an F value of 1.35 does not reach the 0.05 level of significance set for this study. Socioeconomic status as measured in this study and when tested in the presence of intelligence, sex, the teacher variable, and the students' total reading score, does not contribute significantly to the variance of scores on the STEP Essay Test.

Hypothesis 2 c

There will be a significant contribution to the variance of scores on the STEP Essay by the students' sex, in the presence of intelligence, socioeconomic status, the teacher variable, and the students' total reading scores.

For this hypothesis the derived regression equation from the appropriate restricted model was:

$$\hat{Y} = .035X_1 - .012X_2 + .080X_3 + 0.134X_4 + .456X_6 + .071$$

The obtained F value of 20.03 is, as shown in Table V, highly significant. Knowledge of the students' sex contributes significantly to the prediction of composition scores when the contribution of the other predictor variables is taken into account.

III. HYPOTHESES ON READING HABITS

To test Hypothesis 3 the sample of 147 students was divided into three groups on the basis of scores obtained on the STEP Essay Test. Table VII defines the three groups of writers.

TABLE VII
DESCRIPTION OF COMPOSITION WRITING GROUPS

Writing Group	STEP Essay Scores	Size of Group
Effective Writers	10 - 14	20
Moderately Eff. Writers	6 - 9	97
Ineffective Writers	0 - 5	30
Total		147

Hypothesis 3(a)

There will be significant differences among the three groups of writers with reference to the number of books in their homes.

Students' responses to Question 1 of the questionnaire on Reading Habits were used to test this hypothesis. Table VIII shows the relationship between the composition groups and the number of books students reported were present in their homes.

TABLE VIII

SUMMARY CHI SQUARE ANALYSIS
COMPARING OBSERVED AND (EXPECTED) FREQUENCIES
OF NUMBER OF BOOKS FOR GROUPS OF WRITERS

Writing Group	Number of Books		
	0 - 100	101 - 200	over 200
Effective Writers	10 (10.44)	5 (5.08)	4 (3.48)
Moderately Effective Writers	47 (48.37)	24 (23.51)	17 (16.12)
Ineffective Writers	15 (13.19)	6 (6.41)	3 (4.40)

$$\chi^2 = 0.92, \quad df = 4, \quad \text{N.S.}$$

As shown the chi square of 0.92 is not significant and Hypothesis 3(a) is not accepted. That is, there is no significant difference in the number of books in the homes of the three groups of writers. Table IX shows the average number of books in the homes of the three groups of writers.

TABLE IX

MEAN NUMBER OF BOOKS
IN HOMES OF THREE GROUPS OF WRITERS

Writing Group	Number of Students in Group	Mean Number of Books
Effective Writers	19	156.05
Moderately Effective Writers	18	153.35
Ineffective Writers	24	128.75
Total	131	149.24

Hypothesis 3(b)

There will be significant differences among the three groups of writers with reference to the number of books they read per year.

Responses to questions 2(a) and 2(b) were used to test hypothesis 3(b). For the analysis, students' answers to both questions were combined, since the original purpose for having the question in two parts was to make it easier for the students to reply more accurately. It should be pointed out that when students reported the number of books read they were recalling from memory; thus the accuracy of the answers is open to question. At best, the numbers given can be considered only as approximations.

Table X shows the number of students responding to this question and the mean number of books read per year by each group of writers.

TABLE X

MEAN NUMBER OF BOOKS READ
PER YEAR BY THREE GROUPS OF WRITERS

Writing Group	Number of Students in Group	Mean Number of Books
Effective writers	20	20.90
Moderately Effective Writers	93	14.80
Ineffective Writers	28	12.57
Total	141	15.01

As previously mentioned the responses to questions 2(a) and 2(b) may best be considered as approximations. The figures shown in Table X do, however, appear realistic in that they compare closely to data reported by other studies using these same questions. For example, Campbell, in his study of "Leisure Reading in the Senior High Schools of Alberta", reports that for grades X, XI, and XII "the average number of books read per student per year appeared to be approximately seventeen".¹

Students' responses to questions 2(a) and 2(b) regarding the

¹ Charles Campbell, "Leisure Reading in the Senior High Schools of Alberta", (unpublished Master's Thesis, University of Alberta, 1962), p. 72.

number of books read were tested for significance by a one-way analysis of variance. It was felt that for these questions the assumptions underlying a one-way analysis of variance were adequately met. Table XI summarizes the results of this analysis.

TABLE XI

SUMMARY ANALYSIS OF VARIANCE
FOR RESPONSES OF 141 STUDENTS
TO QUESTIONS 2(a) AND 2(b)

Source of Variation	Sum of Squares	df	Variance Estimate
Between	1, 036.08	2	518.04
Within	11,166.89	138	80.91
Total	12,202.97	140	F = 6.40 *

* Significant, $p < .01$

By using the .05 level of significance, the critical value for the above test is $F_{.95}(2,138) = 3.06$. Since the observed F ratio, $F = 6.40$, is larger than the critical value, the data support the hypothesis of a significant difference in the number of books read by the three groups of composition writers. Using a t-test, the means of the three groups were subsequently compared to determine which differences between pairs of means are significant. Table XII shows the comparison of means for the three groups.

TABLE XII

COMPARISON OF PAIRS OF MEANS FOR NUMBER
OF BOOKS READ BY THREE GROUPS OF WRITERS
(USING WITHIN - GROUP VARIANCE ESTIMATE)

Groups compared	Obtained t	Significance
Effective versus Ineffective Writers	$t = 3.17$	Significant ($p < .01$)
Effective versus Moderately Effective Writers	$t = 2.75$	Significant ($p < .01$)
Moderately Effective versus Ineffective Writers	$t = 1.15$	N. S.

Clearly, the effective writers of written composition read a significantly greater number of books than do the moderately effective or the ineffective writers. The mean number of books read by the moderately effective writers does not differ significantly from the mean number read by the ineffective writers.

Hypothesis 3(c)

There will be significant differences among the three groups of writers in the extent to which they find reading pleasurable.

Question 3 was designed to gather responses to test this hypothesis. The results of a chi square test on these responses are shown in Table XIII. To avoid small frequencies the "Never" and "Rarely" responses and the "Often" and "Always" responses were combined.

TABLE XIII

SUMMARY CHI SQUARE ANALYSIS
COMPARING OBSERVED AND (EXPECTED) FREQUENCIES
OF ATTITUDE TOWARDS READING FOR GROUPS OF WRITERS

Writing Group	Attitude Towards Reading		
	Never or Rarely Pleasurable	Sometimes Pleasurable	Often or always Pleasurable
Effective Writers	0 (0.82)	4 (5.84)	16 (13.33)
Moderately Effective Writers	1 (3.96)	31 (28.37)	65 (64.67)
Ineffective Writers	5 (1.22)	8 (8.78)	17 (20.00)

$$\chi^2 = 16.88, \quad df = 4, \quad .001 < p < .01$$

The acceptance of the hypothesis indicates that there is a significant difference among the three groups in the extent to which they find reading pleasurable. More specifically, the results show that the ineffective writers do not find reading as pleasurable an activity as do the more effective writers.

Hypothesis 3(d)

There will be significant differences among the three groups of composition writers with respect to specific reading habits.

Student responses to question four were used to test this hypothesis. In this question students were asked to indicate their reading habits in rank order of 1, 2, and 3. It was hoped that this procedure would encourage careful responses. For purpose of analysis,

however, only students' "first responses" were tested for significance. Table XIV shows the results of a chi square test for each item.

No significant differences among the responses of the three groups of writers were found to exist for the five items: "at every opportunity", "in preference to other forms of recreation", "when I am required to read", "in my free time at school", and "often when I should be doing home assignments". In other words, the three groups of writers do not differ significantly with respect to statements most characteristic of their reading habits.

Hypothesis 3(e)

There will be significant differences among the three groups of writers with reference to the types of reading materials read.

This hypothesis was tested for significance by applying chi square tests to students' responses to question five of the questionnaire on Reading Habits. The results are shown in Table XV.

It is apparent that except for the reading of prose the three groups of writers do not differ significantly with respect to the eight types of reading material. The genres of reading do not significantly discriminate among the three groups of composition writers. However, it is interesting to note, as shown in Table XVI, the different rankings of students' preferences for the various kinds of literature.

The responses indicate that the reading of "fiction" was the main preference for all three groups, while concern for "fact" ranked third for the three groups, and the reading of "plays" last. Reading of "prose" and "poetry" ranked higher for the effective group than for the other two groups. Ineffective writers, however, indicated a greater preference for reading newspapers and magazines than did the effective

TABLE XIV

SUMMARY CHI SQUARE ANALYSES
COMPARING OBSERVED AND (EXPECTED) FREQUENCIES
OF RESPONSES TO FIVE ITEMS ASSESSING
READING HABITS FOR THREE GROUPS OF WRITERS

Reading Habits	Groups of Writers			df	χ^2	Significance
	Effective Writers	Moderately Effective Writers	Ineffective Writers			
At every opportunity	Yes	7 (3.71)	13 (16.92)	6 (5.37)	2	4.91 N.S.
	No	11 (14.29)	69 (65.08)	20 (20.63)		
In preference to other forms of recreation	Yes	1 (3.14)	17 (14.32)	4 (4.54)	2	2.45 N.S.
	No	17 (14.85)	65 (67.68)	22 (21.46)		
When I am required to read	Yes	2 (4.43)	22 (20.17)	7 (6.40)	2	2.06 N.S.
	No	16 (13.57)	60 (61.83)	19 (19.60)		
In my free time at school	Yes	5 (3.43)	15 (15.62)	4 (4.95)	2	1.14 N.S.
	No	13 (14.57)	67 (66.38)	22 (21.05)		
Often when I should be doing home assignments	Yes	3 (3.29)	15 (14.97)	5 (4.75)	2	0.05 N.S.
	No	15 (14.71)	67 (67.03)	21 (21.25)		

TABLE XV

SUMMARY CHI SQUARE ANALYSES
COMPARING OBSERVED AND (EXPECTED) FREQUENCIES OF
READING MATERIAL PREFERRED BY THREE GROUPS OF WRITERS

Reading Material		Groups of Writers			df	χ^2	Significance
		Effective Writers	Moderately Effective Writers	Ineffective Writers			
Prose	Yes	13 (8.30)	40 (40.25)	8 (12.45)	2	7.27	02 < p < .05
	No	7 (11.70)	57 (56.75)	22 (17.55)			
Poetry	Yes	7 (3.95)	19 (19.14)	3 (5.92)	2	4.73	N. S.
	No	13 (16.05)	78 (77.86)	27 (24.08)			
Magazines	Yes	11 (13.06)	69 (63.35)	16 (19.59)	2	4.28	N. S.
	No	9 (6.94)	28 (33.65)	14 (10.41)			
Fact	Yes	12 (10.07)	50 (48.83)	12 (15.10)	2	2.09	N. S.
	No	8 (9.93)	47 (48.17)	18 (14.90)			
Plays	Yes	2 (2.04)	12 (9.90)	1 (3.06)	2	2.04	N. S.
	No	18 (17.96)	85 (87.10)	29 (26.94)			
News-papers	Yes	5 (6.67)	34 (32.33)	10 (10.00)	2	0.76	N. S.
	No	15 (13.33)	63 (64.67)	20 (20.00)			
Fiction	Yes	17 (17.96)	88 (87.10)	27 (26.94)	2	0.59	N. S.
	No	3 (2.04)	9 (9.90)	3 (3.06)			
Essays	Yes	2 (2.99)	15 (14.52)	5 (4.49)	2	0.47	N. S.
	No	18 (17.01)	82 (82.48)	25 (25.51)			

writers. One must remember, however, that when the students' preferences were tested for significance, only the reading of prose was found to be significant.

TABLE XVI

RANKINGS OF STUDENTS' PREFERENCES
FOR EIGHT TYPES OF READING MATERIAL

Ranking	Groups of Writers			All Groups
	Effective Writers	Moderately Effective Writers	Ineffective Writers	
1	Fiction	Fiction	Fiction	Fiction
2	Prose	Magazines	Magazines	Magazines
3	Fact	Fact	Fact	Fact
4	Magazines	Prose	Newspapers	Prose
5	Poetry	Newspapers	Prose	Newspapers
6	Newspapers	Poetry	Essays	Poetry
7	Essays	Essays	Poetry	Essays
8	Plays	Plays	Plays	Plays

Hypothesis 3(f)

There will be significant differences among the three groups of writers with reference to the number of magazines they have in their homes.

Question six of the Questionnaire on Reading Habits was designed to elicit responses to test this hypothesis. The number of

weekly and the number of monthly magazines recorded by each student were added for analysis in this study. The results of a chi square test on the students' responses to this question are recorded in Table XVII.

TABLE XVII

SUMMARY CHI SQUARE ANALYSIS
COMPARING OBSERVED AND (EXPECTED) FREQUENCIES OF
NUMBER OF MAGAZINES IN THE HOMES OF THREE GROUPS OF WRITERS

N = 142

Groups of Writers	Number of Magazines				
	0 - 1	2 - 3	4 - 5	6 - 7	Over 7
Effective Writers	1 (2.94)	5 (5.62)	6 (4.68)	4 (3.75)	3 (2.01)
Moderately Effective Writers	15 (14.72)	26 (28.10)	26 (23.42)	18 (18.73)	10 (10.04)
Ineffective Writers	6 (4.34)	11 (8.28)	3 (6.90)	6 (5.52)	2 (2.96)
$\chi^2 = 6.79,$ $df = 8,$ N.S.					

As shown in Table XVII the chi square of 6.79 is not significant, indicating that there is no significant difference in the number of weekly and monthly magazines in the homes of the three groups of writers.

Hypothesis 3(g)

There will be significant differences among the three groups

of writers with respect to their frequency of reading magazines.

This hypothesis was tested for significance by applying a chi square test to students' responses to question seven of the Questionnaire on Reading Habits. The results are shown in Table XVIII.

TABLE XVIII

SUMMARY CHI SQUARE ANALYSIS
COMPARING OBSERVED AND (EXPECTED) FREQUENCIES
OF THE READING OF MAGAZINES FOR THREE GROUPS OF WRITERS

N = 147

Groups of Writers	Frequency of Reading Magazines			
	Every Day	Two or Three Days a Week	Once a Week	Once a Month Seldom or never
Effective Writers	3 (2.45)	6 (7.07)	7 (6.94)	4 (3.54)
Moderately Effective Writers	12 (11.88)	38 (34.31)	32 (33.65)	15 (17.15)
Ineffective Writers	3 (3.67)	8 (10.61)	12 (10.41)	7 (5.31)

$\chi^2 = 2.64,$ $df = 6,$ N. S.

The chi square value of 2.64 indicates that there is no significant difference in the frequency of reading of magazines by the three groups of composition writers.

Hypothesis 3(h)

There will be significant differences among the three groups of writers with respect to their frequency of reading of newspapers.

Students' responses to question eight were used to test this hypothesis. Table XIX records the results of a chi square test on these responses.

TABLE XIX

SUMMARY CHI SQUARE ANALYSIS
COMPARING OBSERVED AND (EXPECTED) FREQUENCIES OF
THE READING OF NEWSPAPERS FOR THREE GROUPS OF WRITERS

N = 147

Groups of Writers	Frequency of Reading Newspapers		
	Every Day	Two or Three Days a Week	Once a Week Seldom or Never
Effective Writers	15 (12.11)	4 (4.49)	1 (3.40)
Moderately Effective Writers	59 (58.73)	20 (21.78)	18 (16.50)
Ineffective Writers	15 (18.16)	9 (6.73)	6 (5.10)

$$\chi^2 = 4.64, \quad df = 4, \quad N. S.$$

The chi square value of 4.64 indicates that there is no significant difference in the frequency of reading newspapers by the three

groups of writers.

Hypothesis 3(i)

There will be significant differences among the three groups of writers with reference to their reading of particular parts of the newspapers.

Students' responses to question nine of the questionnaire on Reading Habits were used to test this hypothesis. Question nine required the students to check which of eight types of reading they read in the newspapers. Students' responses to each of the eight types of reading were checked for significance by means of chi square tests. The results of the eight chi square tests are recorded in Table XX.

As shown in Table XX significant differences were found among the three groups of writers for only two types of newspaper reading. A significantly greater number of effective writers than less effective writers read "editorials" and "foreign news". Although the groups of writers do not differ significantly in their reading of other parts of the newspapers, it is interesting to note some particular trends in the students' reading habits by ranking their responses to the eight types of reading material. Table XXI shows such a ranking of the students' responses.

One notes that seventy-seven percent of the 147 students indicate that they read the "comics" section of the newspapers and one further notes that the "comics" are read by over seventy percent of the students in each writing group. Also one notes that the better the writing group the higher is the percentage of students who read "local news", "national news", "foreign news", "editorials", and "columns". A greater percentage of ineffective than effective writers indicate that they read the "sports" section of the newspaper.

TABLE XX

SUMMARY CHI SQUARE ANALYSES
COMPARING OBSERVED AND (EXPECTED) FREQUENCIES OF
NEWSPAPER SECTIONS PREFERRED BY THREE GROUPS OF WRITERS

Reading Material		Groups of Writers			df	χ^2	Significance	
		Effective Writers	Moderately Effective Writers	Ineffective Writers				
Editorials	Yes	12 (6.39)	29 (31.01)	6 (9.59)	2	9.40	.001	p .01
	No	8 (13.61)	68 (65.99)	24 (20.41)				
Foreign News	Yes	10 (8.30)	45 (40.25)	6 (12.45)	2	7.27	.02	p .05
	No	10 (11.70)	52 (56.75)	24 (17.55)				
Columns	Yes	10 (8.57)	46 (41.57)	7 (12.86)	2	5.92		N. S.
	No	10 (11.43)	51 (55.43)	23 (17.14)				
National News	Yes	14 (11.84)	60 (57.41)	13 (17.76)	2	4.38		N. S.
	No	6 (8.16)	37 (39.59)	17 (12.24)				
Society	Yes	3 (4.35)	25 (21.12)	4 (6.53)	2	2.70		N. S.
	No	17 (15.65)	72 (75.88)	26 (23.47)				
Sports	Yes	6 (8.84)	43 (42.89)	16 (13.27)	2	2.64		N. S.
	No	14 (11.16)	54 (54.11)	14 (16.73)				
Local News	Yes	15 (13.06)	63 (63.35)	18 (19.59)	2	1.21		N. S.
	No	5 (6.94)	34 (33.65)	12 (10.41)				
Comics	Yes	15 (15.65)	78 (75.88)	22 (23.47)	2	0.82		N. S.
	No	5 (4.35)	19 (21.11)	8 (6.53)				

TABLE XXI

PERCENTAGE RANKINGS OF STUDENTS'
PREFERENCE FOR PARTS OF NEWSPAPERS

N = 147

Newspaper Section	Percentage Who Read			All Groups N = 147
	Effective Writers N = 20	Moderately Effective Writers N = 97	Ineffective Writers N = 30	
Comics	75	80	73	77
Local News	75	65	59	65
National News	70	62	43	59
Sports	30	44	53	44
Columns	50	47	23	43
Foreign News	50	46	20	41
Editorials	60	30	20	32
Society	15	26	13	22

CHAPTER V

SUMMARY, CONCLUSIONS AND SUGGESTIONS FOR FURTHER RESEARCH

I. SUMMARY

The purpose of this study was to ascertain whether students' written composition ability (as measured by the STEP Essay Test) is related to students' reading ability (as measured by the Cooperative Reading Comprehension Test) and to their reading habits. Specifically, the relationship of students' written composition ability to their reading ability was investigated in the presence of four other possible predictor variables: sex, intelligence, socioeconomic status of the family, and the teacher variable. The relationship of these four variables to students' written composition ability was also studied. In addition, students' reading habits were investigated to determine their discriminating power among effective, moderately effective, and ineffective writers of written composition.

The main findings of the investigation may be summarized as follows:

1. There is a significant relationship between the students' written composition scores and their reading ability scores when the relationship is measured in the presence of the students' intelligence scores, the socioeconomic level of the family, the sex of the pupil, and the teacher variable.
2. There is a significant relationship between the students' written composition scores and their vocabulary scores when the relationship is measured in the presence of

students' intelligence scores, the socioeconomic level of the family, the sex of the pupil, the teacher variable, and the students' reading comprehension scores.

3. There is a significant relationship between students' written composition scores and their intelligence scores when the relationship is measured in the presence of the socioeconomic level of the family, the sex of the student, the teacher variable, and the students' reading ability scores.
4. There is a significant relationship between the students' composition scores and the sex of the pupil when the relationship is measured in the presence of the students' intelligence, socioeconomic level of the family, the teacher variable, and the students' reading ability scores.
5. For the 147 students included in this investigation the scores indicating the socioeconomic level of the family do not significantly contribute to the variance of scores on the STEP Essay Test, when they were considered in the presence of intelligence, sex of the pupil, the teacher variable, and the reading ability scores.
6. The effective writers of written composition read a significantly greater number of books per year than do the moderately effective or ineffective writers.
7. A significantly greater number of effective writers than less effective writers of written composition find reading a pleasurable activity.
8. There are no significant differences among the three groups of composition writers with respect to their time of reading, that is, reading "at every opportunity", "in preference to other forms

of recreation", "when I am required to read", "often when I should be doing home assignments", and "in my free time at school".

9. A significantly greater number of effective writers than less effective writers of written composition read the "editorial" and "foreign news" sections of the newspapers.
10. There are no significant differences among the three groups of composition writers with respect to the number of books in their homes.
11. Although several trends are evident, the three groups of writers do not differ significantly in their reading of poetry, plays, essays, fact, fiction, newspapers, and magazines. A significantly greater number of effective writers than less effective writers did indicate that they read prose.

II. CONCLUSIONS AND IMPLICATIONS

It is convenient to group the contents of this section under three headings, following the three groups of hypotheses.

Hypotheses 1, 1a, and 1b

It was found that Hypothesis 1, the major hypothesis of this study, postulating a significant relationship between students' written composition scores and their reading ability scores in the presence of intelligence, sex of the pupil, the socioeconomic level of the family, and the teacher variable, was supported. This finding indicates that with a knowledge of the reading ability scores of the 147 students one can make a significantly better prediction of their composition scores than one could make by knowing only intelligence scores, socioeconomic

scores. the sex of the pupil. and the teacher by whom the students were taught. However. when the total reading score was broken into its two component parts of vocabulary scores and reading comprehension scores. it was found that students' vocabulary scores accounted for a greater part of the variance of essay scores. Thus. as postulated in Hypothesis 1(a), there was a significant relationship between students' written composition scores and their vocabulary scores, when the relationship was considered in the presence of selected variables.

Hypothesis 1(b), postulating a significant relationship between students' written composition scores and their reading comprehension scores, was not supported. However, it is recognized that to add significantly to the predictive power of an equation, variables should be chosen which are highly related to the criterion variable and unrelated or poorly related to each other. In the case of reading comprehension, it is noted from Table VI that while moderately related to composition (.47), reading comprehension shows a fairly high relation to two other predictor variables, vocabulary (.71) and intelligence (.68). Thus in the presence of these two variables reading comprehension does not add significantly to the variance of the composition scores. It is most important to remember that an understanding of the relationship of variables investigated in this study must be achieved by considering the variables in combination.

This study has shown that reading ability is significantly related to composition ability. Both vocabulary and reading comprehension taken separately are significantly related to the criterion variable. However, considering all predictor variables in combination, the voc-

abulary scores add significantly to the variance of composition scores, whereas the reading comprehension scores do not.

It may be suggested that vocabulary and written composition are related in that vocabulary not only facilitates a fuller and richer expression of one's ideas but also enables one to profit more from his experiences, both personal and acquired. It is to be understood that the present study in no way attempted to determine the nature of the relationship found to exist between written composition and reading ability. It merely established that such a relationship exists and is significant beyond a consideration of other factors such as sex, intelligence, socioeconomic status, and the teacher variable. It might well be worthwhile to investigate this relationship further, with a view to determining how reading ability, and vocabulary in particular, operate in the improvement of written composition and how the effects of this operation might be increased.

Hypotheses 2a, 2b, and 2c.

Test results on Hypotheses 2a and 2c concur with the conclusions already reported in the literature. The results reveal that in this study there are both sex differences and intelligence differences associated with students' skill in written composition. Thus, at this grade level boys and girls appear to constitute separate populations with regard to written composition, as do students of high and low intelligence. Cognizance should be taken of these facts by English teachers.

This and other studies have shown that boys' achievement in the area of written composition is below that of girls. Before attempts

can be made to equalize their performance, research will have to be aimed at determining why this sex difference exists. It is possible that it is in part a difference of interest and motivation which leads one to suggest that the difference might be narrowed depending upon the topic chosen to elicit a sample of the students' writing. It is conceivable that the topic used in the present study (see Appendix A) might have been more receptive to the girls who do on the average show interest in maturity at an earlier age than do the boys. However, the publishers claim to have taken sex differences into account in the selection of the essay topic for Form 2a of the STEP Essay Test.

Hypothesis 2b was not supported by the results of this study. Socioeconomic status did not contribute significantly to the variance of scores on the STEP Essay Test. To a certain extent this finding is somewhat difficult to explain, since the different studies summarized in Chapter II of this thesis show that there is a positive relationship between the socioeconomic level of the family and students' skill in written composition. However, with the exception of Donelson's study the literature reviewed relates primarily to elementary school children.

One can suggest possible reasons for this lack of relationship between the socioeconomic status of the family and the students' written composition ability. Since writing skills are taught primarily by the schools, it is possible that the home environment has a lesser influence on their development than does the school environment. Nevertheless, language skills acquired in the home undoubtedly are utilized and built upon in the learning of writing skills. It therefore would be expected that children whose home environments have been intellectually stimulating and most conducive to the development of language skills would be at an

advantage in the learning of writing skills. This advantage is most likely to show itself early in the school life of the student as is evidenced by the significant positive relationship between socioeconomic status and written composition at the elementary school level. However, one would expect extensiveness of schooling to contribute to the development of writing skills and to some extent offset the earlier disadvantage experienced by some students. Thus at the grade ten level the relationship between the socioeconomic status and the writing ability of the students would be less.

A second reason for the lack of relationship is probably inherent in the nature of the assigned essay topic itself. The publishers claim that the essay topic was selected so as to take into account socioeconomic, regional, cultural, and religious differences of the students. Thus the topic was selected so as not to give advantage to students from different socioeconomic levels. A third possible reason for the lack of a significant relationship resides with the grade level chosen for investigation. Research has repeatedly indicated that recruitment to senior secondary schooling is considerably greater from the higher social and income groups than from the lower. It might well be that the low correlation found in this study between socioeconomic status and writing ability is in part a function of a somewhat narrower range of socioeconomic status than one finds at the elementary school level where in turn such correlations are usually higher.

Hypotheses on Reading Habits

One of the main conclusions reached regarding the reading habits of effective, moderately effective, and ineffective writers of written composition is that effective writers read a significantly greater number of books per year than do the moderately effective and ineffective

writers. While this relationship must not be accepted as an indication of causality, it nevertheless bears the implication that the development of a habit of reading extensively may well show positive results in the quality of written composition. This implication appears to be supported by noting the results of tests on Hypothesis 3c, which show that except for the reading of "prose" the three groups of writers do not differ significantly with respect to the types of reading materials they read. Teachers and parents, therefore, should encourage their children to read widely the different types of literature in the hope that what they read will make them more sensitive to language, sentence structure, and vocabulary. Wide reading should furnish the students with the ideas and the stimulus for writing.

It was found that availability of books in the home was not a significant discriminating factor among the three groups of writers. The effective writers do not have a significantly greater number of books in their homes than do the moderately effective or the ineffective writers. It is not to be inferred from the above that the students do not read in their leisure time the books available to them in their homes. However, the fact that the effective writers read more books than the ineffective writers would indicate either that they borrow more extensively from libraries or that the ineffective writers read fewer of the books available to them at home.

A significantly greater number of effective writers than ineffective writers indicated that they find reading a pleasurable activity. Thus on the assumption that finding pleasure in one's reading induces one to continue reading, teachers should try to determine students' interests, provide books that may be related to these interests and use procedures that may arouse within the students a strong desire to read.

III. SUGGESTIONS FOR FURTHER RESEARCH

Although this study has shown that there is a significant relationship between students' written composition ability and their reading ability and that this relationship is significant beyond a consideration of other factors such as sex, intelligence, socioeconomic status and the teacher variable, it has not attempted to investigate the nature of this relationship. The whole question of the exact relationship between reading and writing needs to be studied. Further study might determine the relationship between written composition and some of the different reading skills which constitute skill in reading comprehension, namely, organizing meanings, drawing conclusions from the content, and construing the writer's meaning. Will an increase in reading ability necessarily result in improvement in written composition? What are the effects of various kinds and amounts of reading on the quality and kinds of writing a person does? These questions have not been studied extensively.

It should also be recognized that although the present study was multivariate in nature, there are many other variables which probably have a relationship to students' proficiency in written composition. For example, what is the relationship of the following to skill in written composition: intelligence, socioeconomic status of the family, sex of the pupil, students' personality, knowledge of grammar, knowledge of logic, knowledge of linguistics, students' English class attitudes, creativity, prior experiences, motivation, reading ability, reading habits, oral expression, the teacher's method of teaching, the method of evaluation, students' vocabulary, the choice of essay topic, and other possible variables?

The present investigator sees the need for multivariate studies in written composition and the assessing of the influence of one variable in the presence of other variables. The availability of high speed computers and programs involving the use of multiple regression analysis will hopefully lead to such studies.

Ultimately, the teacher's knowledge of the many different variables related to composition writing, his knowledge of the nature of these relationships, and his ability to apply this knowledge must be regarded as variables associated with his success in teaching written composition.

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A P P E N D I C E S

NAME	DATE
SCORE	

Appendix A

Essay Test

General Guidelines

The essay test is a written test in which you are asked to write an answer to a question. The questions are usually open-ended, meaning that there is no single correct answer. The purpose of the essay test is to assess your ability to think critically, analyze information, and communicate your ideas in writing.

APPENDIX A

ESSAY TEST

1. Read the question carefully. Make sure you understand what is being asked of you. Underline key words in the question.
2. Plan your answer. Think about the main points you want to make and the evidence you will use to support them. Write a brief outline of your answer.
3. Write your answer. Start with a clear topic sentence that states your main point. Then, provide evidence and analysis to support your point. Use clear, concise language and proper grammar. End with a concluding sentence that summarizes your main point.
4. Review your answer. Check for errors in grammar, spelling, and punctuation. Make sure your answer is clear and easy to read.

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SCORE

008
NAME _____
(PRINT) LAST FIRST MIDDLE
AGE _____
YEARS MONTHS GRADE OR CLASS
SCHOOL _____
TODAY'S DATE _____ 1. _____
MONTH DAY YEAR 2. _____ 3. _____

DO NOT
WRITE
HERE

Cooperative
Sequential Tests of Educational Progress
Essay Test

General Directions

The purpose of this test is to find out how well you can write an essay. First you will read a short passage which will tell you what you are to write about. Then you should plan what you want to say and the order in which you want to say it. As soon as you have finished planning, you should begin to write. You will have about thirty minutes for writing.

Here are a few suggestions which will help you to do your best on the test:

1. Start planning your paper as soon as you know what you are to do. You may use the space underneath the reading passage or the back of your booklet for making notes about your plans.
 2. While spelling and punctuation will be considered in grading your paper, what you have to say and how well you say it will be more important. Therefore, you should spend most of your time getting your ideas down in a clear, well-organized form. Watch your handwriting, too; your paper cannot be marked if no one can read it.
 3. Save a little time at the end to check your paper and make any needed changes. Since there will not be time to copy what you write, make your changes neatly by writing between the lines.
-

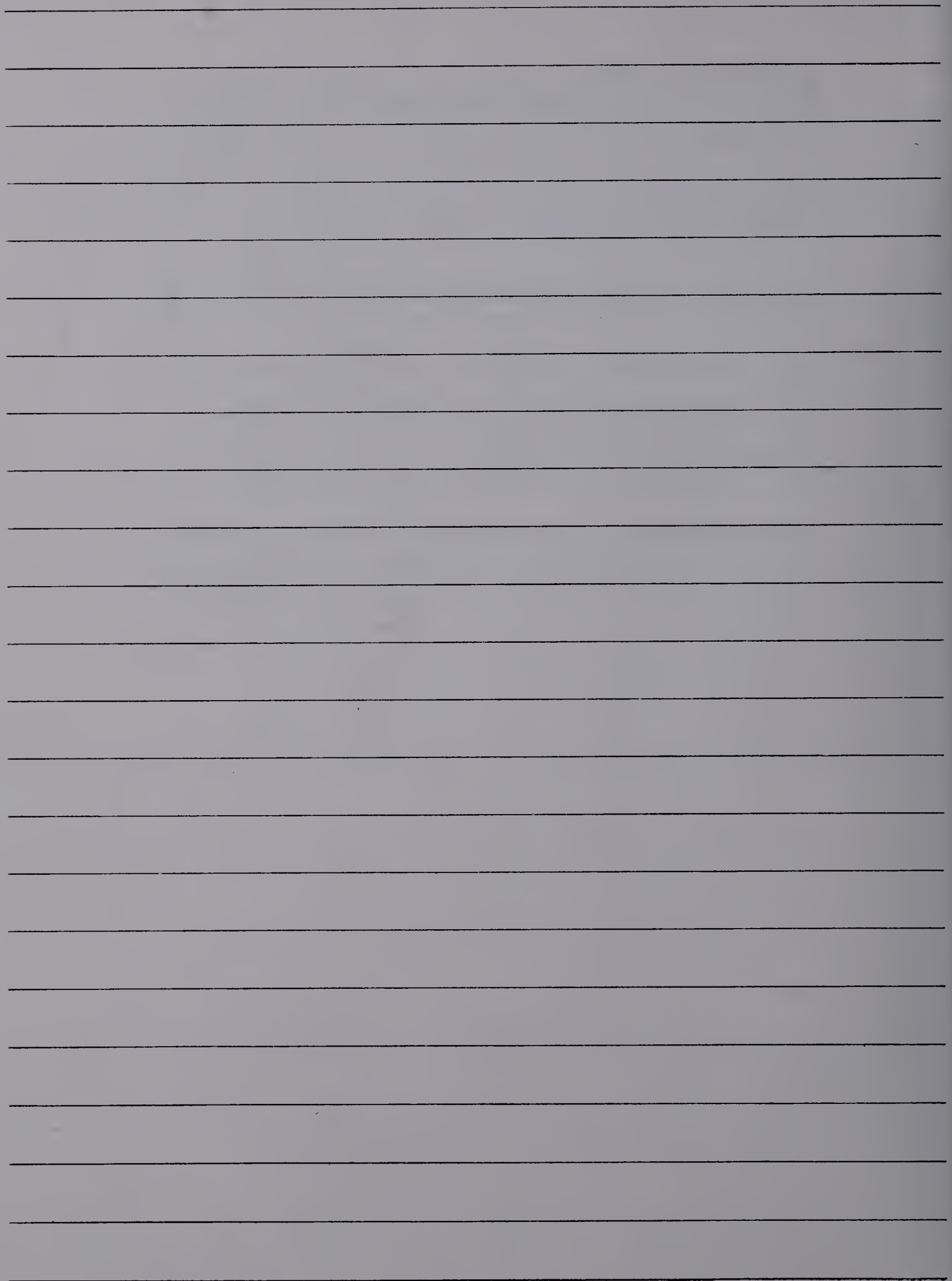
Do not turn the page until you are told to do so.

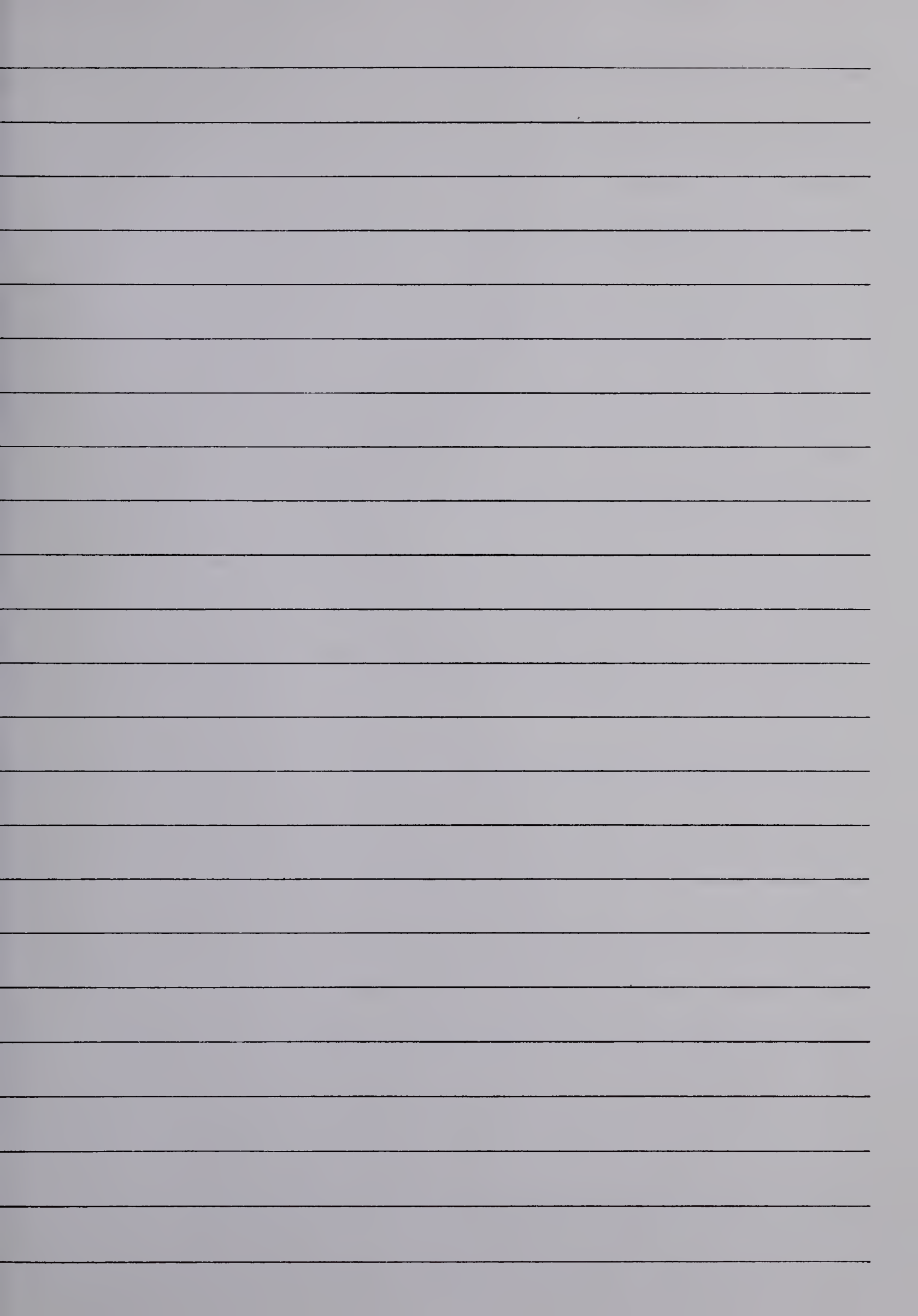
Teen-agers often find their situation confusing, because they are sometimes treated as adults, sometimes as children. When should teen-agers be treated as adults? You might consider some of the following questions in making your decision:

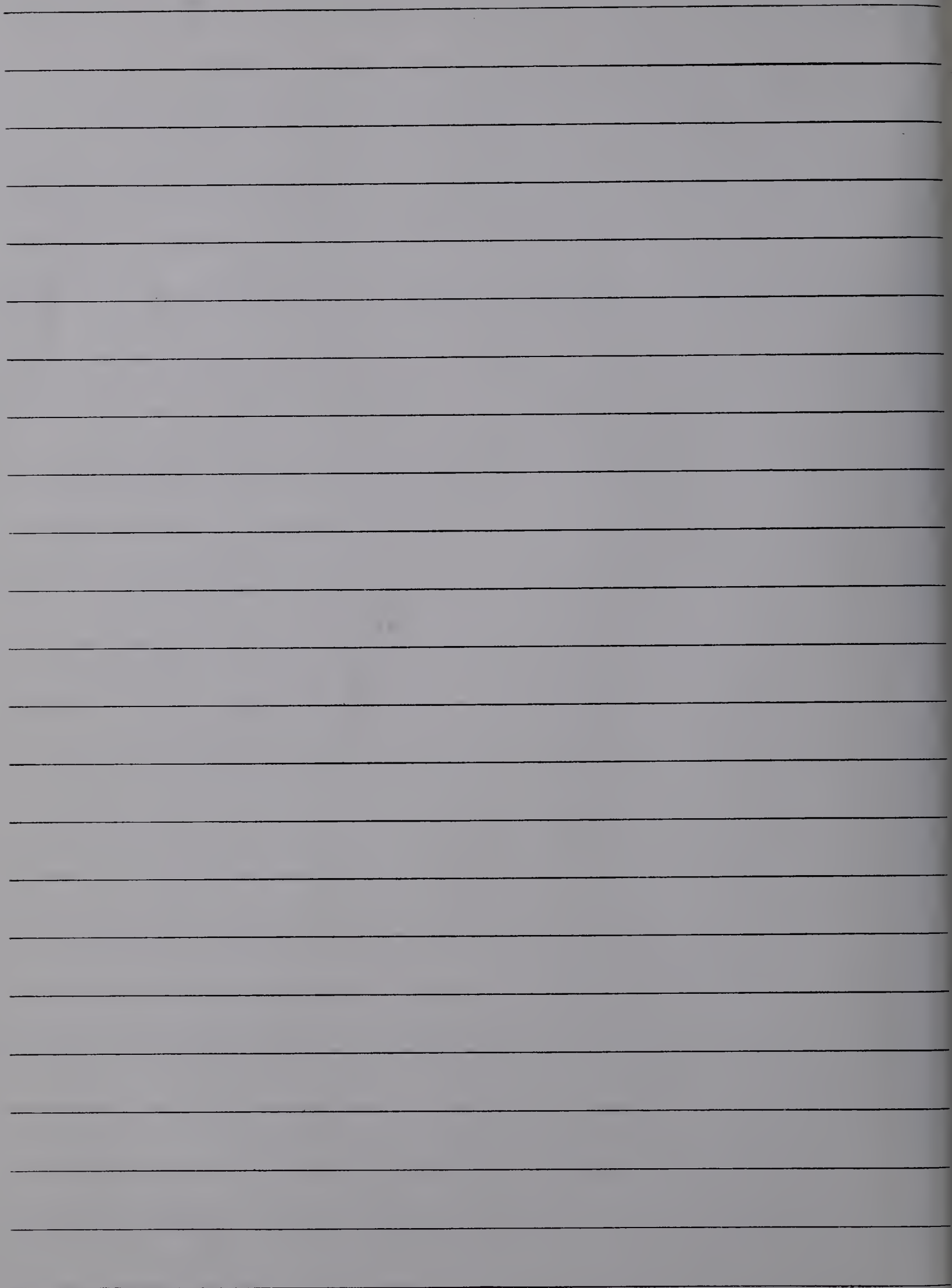
- (a) Are you mature when you reach a certain age? (The government considers eighteen a satisfactory age for military service.)
- (b) Are you mature when you graduate from high school? (The high school diploma indicates that you are ready for work or for college.)
- (c) Are you mature when you have a regular job and are self-supporting? (Many high school students have regular jobs.)
- (d) Are you mature when you can accept responsibility? (Some high school freshmen are more conscientious and dependable than seniors.)

When do *you* think teen-agers should be treated as adults? Give reasons for your opinion, and support it by specific suggestions or examples.











APPENDIX B
READING TEST

FORM 2A

**READING
COMPREHENSION**



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COOPERATIVE TEST DIVISION,
EDUCATIONAL TESTING SERVICE,
PRINCETON, N.J. • LOS ANGELES 27, CALIF.



GENERAL DIRECTIONS

This is a 40-minute test with two parts. The directions for each part are printed at the beginning of the part. When you are told to begin, turn this page and read the directions for the first part. Then go on immediately to answer the questions for that part.

Do not spend too much time on any one question. If a question seems to be too difficult, make the most careful guess you can, rather than waste time puzzling over it. Your score is the number of correct answers you mark. Keep working on the first part until you are told to stop. Do not go on to Part II until you are told to do so.

When you are told to begin Part II, turn the page immediately and read the directions carefully. Then go ahead and answer the questions in Part II.

Mark all of your answers on the separate answer sheet. Make your marks heavy and black. Note the **EXAMPLES** in the upper left-hand corner of your answer sheet. If you make a mistake or wish to change an answer, be sure to erase your first choice completely.

**Do not turn this page
until you are told to.**

**COOPERATIVE
ENGLISH
TESTS**

PART I: VOCABULARY

(15 minutes)

Directions: In each question select the word or phrase that most nearly means the same thing as the word in darker type. Then mark the letter for that word or phrase next to the number of the question on your answer sheet. See the example below.

EXAMPLE

E1 boast

- A sew C brag
B suffer D lift

The letter C for "brag" has been marked opposite **E1** at the top of your answer sheet.

If you finish Part I before time is called, look over your work on it. DO NOT GO ON TO PART II.

1 artery

- A muscle tissue
B blood vessel
C throat
D spring

2 litter

- E musical composition
F scattered rubbish
G public show
H coloring matter

3 recuperation

- A relapse
B recollection
C summary
D recovery

4 plea

- E appeal
F reply
G charge
H situation

5 astound

- A scold severely
B make angry
C surprise greatly
D drive out

6 surf

- E breaking waves
F celestial being
G ridge of sand
H narrow groove

7 yelp

- A shrill cry
B swallow
C puppy
D harsh laugh

8 bayonet

- E inlet
F basket
G sharp weapon
H short gun

9 sterile

- A simple
B free of germs
C unnatural
D without color

10 taut

- E rough
F small
G useless repetition
H tightly drawn

11 appalling

- A steady
B shocking
C considerate
D difficult

12 exterminate

- E extend farther
F fight against
G destroy completely
H clean

13 nimble

- A quick and light
B stiff and cold
C sluggish
D sentimental

14 expel

- E blot out
F force out
G lose
H leave

15 pleat

- A lure
B finish
C surround
D fold

16 polo

- E a weapon
F a beverage
G a game
H a disease

17 soar

- A fly
B break
C look
D shift

18 unflinching

- E antagonistic
F boastful
G merciless
H steadfast

19 ingenious

- A frank
B self-conscious
C clever
D scheming

20 potent

- E powerful
F evident
G likely
H brave

21 docile

- A argumentative
B nervous
C impolite
D obedient

22 stagnant

- E seldom participating
F swaying
G not flowing
H stubborn

23 sloop

- A a plant
B a bird
C a fish
D a boat

24 pry

- E snoop
F enter
G squint
H survey

25 whim

- A amusement
B woman's intuition
C sudden fancy
D pretext

26 massive

- E strong and muscular
F thickly populated
G ugly and awkward
H huge and solid

Go on to the next page.

- 27 amplify
A expand
B electrify
C reply
D supply
- 28 moreover
E therefore
F furthermore
G nevertheless
H however
- 29 unanimous
A not explained
B having no equal
C not interested
D in complete agreement
- 30 drudgery
E self-denial
F worry
G toil
H hatred
- 31 deplore
A send away
B regret deeply
C spread out
D investigate
- 32 unwary
E unusual
F tireless
G deserted
H incautious
- 33 benevolent
A serviceable
B respectable
C charitable
D remedial
- 34 wheedle
E turn around
F breathe hoarsely
G coax
H squeeze
- 35 scintillate
A frown
B blacken
C smoulder
D sparkle
- 36 hilarity
E excitement
F friendliness
G boisterous mirth
H angry shouting
- 37 duplicity
A agreement
B overlapping
C cleverness
D double-dealing
- 38 sham
E false
F foreign
G serious
H reckless
- 39 pilfer
A search
B punch
C steal
D differ
- 40 expunge
E establish
F rub out
G soak up
H discolor
- 41 chink
A insect
B bell
C crack
D lining
- 42 turnkey
E jailer
F thief
G locksmith
H traitor
- 43 splice
A shave
B flatten
C crumble
D join together
- 44 heather
E rope
F fireplace
G shrub
H pottery
- 45 allegation
A unsupported assertion
B wise saying
C weaving motion
D increase in speed
- 46 crony
E storyteller
F paid informer
G intimate companion
H dirty old man
- 47 aversion
A strong dislike
B false accusation
C translation
D declaration
- 48 abjure
E arrest
F renounce
G abuse
H lose
- 49 parry
A vanquish
B talk over
C gamble
D ward off
- 50 din
E confused noise
F vague rumor
G semi-darkness
H herald
- 51 acrimony
A promptness
B bitterness
C stupidity
D divorce
- 52 condescending
E liberal
F patronizing
G consoling
H humorous
- 53 burnish
A polish
B wave
C consume
D heat
- 54 replete
E elderly
F well-filled
G resentful
H discredited
- 55 acclaim
A acquire
B applaud
C protest
D demand
- 56 ephemeral
E impractical
F introductory
G girlish
H short-lived
- 57 bagatelle
A purse
B trifle
C liar
D pamphlet
- 58 prolific
E prehistoric
F freely reproductive
G frivolous
H highly temperamental
- 59 peruse
A read carefully
B wear out
C overtake
D write slowly
- 60 limpid
E lazy
F crippled
G watery
H clear

STOP!

Do not go on to Part II until you are told to.

PART II: READING

(25 minutes)

Directions: Read each passage carefully and then answer the questions about it. In each question, decide on the basis of the passage which one of the choices best answers the question. Then mark the letter for that best choice next to the number of the question on your answer sheet. See the example below.

EXAMPLE

Scotland Yard is a short street in London, named for the palace where the Scottish kings used to stay when they visited England. In 1829 it became the site of the headquarters of the metropolitan police, and the Criminal Investigation Department is today known as "Scotland Yard" even though it has now moved to a different part of the city.

E2 Scotland Yard is a street in

- | | |
|---------------------|--------------------|
| E Edinburgh. | G New York. |
| F Paris. | H London. |

The letter **H** for "London" has been marked opposite **E2** at the top of your answer sheet.

E3 This passage might best be entitled

- A** "How Criminals Get Caught."
- B** "Scottish Kings."
- C** "A Visit to Old England."
- D** "What's in a Name."

The letter **D** for "What's in a Name" has been marked opposite **E3** at the top of your answer sheet.

Try to answer each question in order. Do not skip around. If a question seems to be too difficult, make the most careful guess you can. You are not expected to finish this part in the time allowed, but work as rapidly as you can without making careless mistakes.

The day of the Pony Derby was cloudless and still, a perfect day. The grandstand filled early and hundreds lined the railing. Back in the horse tent all was confusion. Kiddies dashed about, feeding hay to aged 5 beasts while the leather-faced men who timed their charges with stop watches shouted frightful oaths, and assorted mothers, tracking down offspring, complained about their language.

The Shetland division finally moved into place, 10 eleven shaggy beasts, with their riders aged five to eight, ready to start. At the last moment, just as I raised my whistle, Mrs. Krug emerged screaming from the grandstand. "Maybelle!" the frantic mother howled. "She'll fall off." And so Mrs. Krug 15 lined up beside Bozo.

The crowd shouted encouragement as Bozo, Maybelle, and Mrs. Krug began to edge up on Sunny, the favorite. Sunny was a sturdy type, built low to the ground, but with a wicked single-foot. The field 20 lagged far behind, Bozo and Sunny being the only entries who could be urged out of a walk. Just before the finish line someone threw out a piece of sugar. Sunny gave a neigh, broke into a real gallop, and finished ten lengths ahead. Mrs. Krug and Maybelle 25 both cried, but Bozo took his defeat like a man.

"The race was fixed!" Mr. Krug and Junior yelled as they dodged under the railing to join their bereaved family.

The judges took a vote as to whether to disqualify 30 Sunny, but in the end blandly awarded two \$50 first prizes. The business manager tried to pass them up a note, but too late.

1 The weather on the day of the Derby was

- | | |
|-----------------|----------------|
| A windy. | C cold. |
| B wet. | D fair. |

2 The "charges" (line 6) were

- | | |
|--------------------|-----------------------|
| E jockeys. | G accusations. |
| F children. | H horses. |

3 "Their" in line 8 refers to

- | | |
|----------------------------|------------------------------|
| A men (line 5). | C mothers (line 7). |
| B charges (line 6). | D offspring (line 7). |

Go on to the next page.

- 4 The complaint of the mothers (line 7) was that the language
 E was ungrammatical.
 F was too loud.
 G was too technical.
 H was profane.
- 5 The writer was about to blow his whistle (line 12) to
 A start the race.
 B get the ponies in line.
 C quiet the crowd.
 D get the attention of the children.
- 6 Bozo was
 E a Shetland pony.
 F the favorite.
 G Maybelle's brother.
 H a race horse.
- 7 Mrs. Krug lined up beside Bozo to
 A urge him on.
 B get some exercise.
 C keep him on the track.
 D keep Maybelle from falling off.
- 8 Sunny had
 E a slender body. G long legs.
 F short legs. H only one foot.
- 9 "The field" (line 19) means the
 A area inside the track.
 B area outside the track.
 C rest of the ponies.
 D track.
- 10 Bozo's defeat was taken calmly by
 E Junior. G Mr. Krug.
 F Mrs. Krug. H Bozo himself.
- 11 One way this race differed from most horse races is that
 A the slowest pony was to be the winner.
 B all the entries came close to winning.
 C a foot runner accompanied one of the entries.
 D all the ponies went around in a walk.
- 12 Mr. Krug and Junior thought that the race had been fixed because
 E someone accompanied Bozo.
 F someone threw sugar on the track.
 G Sunny used the gallop instead of the single-foot.
 H many of the entries refused to go faster than a walk.
- 13 The business manager's note probably said that
 A there was not enough money for two \$50 prizes.
 B prizes should be given to all eleven entries.
 C Sunny should get \$100 and Bozo \$50.
 D the race should be canceled.

- 14 The crowd probably found the race

E uninteresting. G amusing.
 F disagreeable. H nerve-racking.

All eyes that shine in the dark do so by means of a reflector behind the retina. The little light that is stirring in the outer world enters the pupil, passes through the transparent retina, which utilizes this light for vision, and on to the reflector, which sends it back to the object from which it came. Here it is joined to fresh original light from the object, and the process is repeated. Thus the Carnivora and some other animals whose vision is very much poorer than ours by day see much better at night. And that is why primitive man lived in terror of the dark. He was eater by day, eaten by night.

- 15 The passage implies that eyes that shine in the dark are found in

A the Carnivora only.
 B various animals among which are the Carnivora.
 C most animals that are hunted by other animals.
 D all animals except man.

- 16 Eyes that shine in the dark do so because they

E act like mirrors. G absorb light.
 F act like cameras. H generate light.

- 17 The principal effect of the reflector in an animal's eyes is to

A confuse his prey by making his eyes shine in the dark.
 B provide a source of light.
 C enable him to be seen in the dark.
 D enable him to see better in the dark.

- 18 The passage states that the eyes of some animals are inferior to those of man with respect to

E daytime vision. G night vision.
 F near vision. H distance vision.

- 19 Primitive man lived in terror of the dark because

A he was superstitious.
 B he could not hunt well at night.
 C he saw less well at night than does modern man.
 D wild animals could see better at night than he could.

Go on to the next page.

Color in a painting need not exactly reproduce the original but it ought to be capable of suggesting any human emotion. For example, when Paul Mantz saw the violent and inspired sketch of Delacroix entitled "The Barque of Christ" he turned away from it exclaiming, "I did not know that one could be so terrible with a little blue and green." Another artist, Hokusai, wrings the same cry from you, but he does it by his line, his drawing. One critic remarked, after looking at one of Hokusai's works, "The waves are claws and the ship is caught in them."

If you make the color and the drawing exact you cannot arouse emotions like those.

- 20 The writer evidently believes that a ship ought to be painted in such a way as to
- E look exactly like a ship.
 - F express the artist's personality.
 - G make the observer long for the sea.
 - H produce an emotional reaction.
- 21 According to this passage, both Delacroix and Hokusai
- A relied on similar methods.
 - B showed their works in the same exhibition.
 - C achieved similar effects on the observer.
 - D reproduced the original almost exactly.
- 22 The unusual effectiveness of the painting entitled "The Barque of Christ" appears to depend particularly on the
- E story it tells.
 - F appearance of the sea.
 - G coloring employed.
 - H comparative absence of blue and green.
-

Few turtles are able to carry on a serious offensive battle. Most of them are better equipped defensively, have a carapace, or upper shell, and a plastron, or lower shell. This armor varies from that of the box turtle, which can completely enclose itself in its hard shells, to that of the soft-shelled turtle, whose flabby cartilaginous carapace is little more protective than a pancake.

Some turtles, like the alligator snapping turtle, are ugly and dangerous; others cannot inflict any injury. Turtles live everywhere. Land dwellers, or tortoises, have domical top shells and elephantine legs. One species, the gopher tortoise, lives underground. Other turtles, like the green turtle and the hawksbill, who live in the ocean, have flippers instead of legs; and terrapins, equally at home on land or in the water, have webbed feet.

They range in size from the four-inch mud turtle to the huge trunkback, sometimes over eight feet long. Some are meat eaters, others are vegetarians, and others are not fussy.

- 23 The passage suggests that turtles
- A will eat almost anything.
 - B differ widely in many ways.
 - C are well protected from their enemies.
 - D live in protected places.
- 24 The name given to the turtle's lower shell is
- E plastron.
 - F carapace.
 - G cartilage.
 - H pancake.
- 25 The gopher tortoise
- A looks like a gopher.
 - B lives in shallow ponds.
 - C lives underground.
 - D eats anything he can find.
- 26 The passage states that webbed feet are found on the
- E soft-shelled turtles.
 - F terrapins.
 - G alligator snapping turtles.
 - H mud turtles.
- 27 The green turtle and the hawksbill are alike in having
- A flippers.
 - B bad dispositions.
 - C large legs.
 - D soft shells.
- 28 The largest turtle mentioned is the
- E alligator snapping turtle.
 - F tortoise.
 - G trunkback.
 - H hawksbill.
- 29 The passage implies that the best protected of the turtles mentioned is the
- A hawksbill.
 - B box turtle.
 - C mud turtle.
 - D green turtle.
- 30 The turtles that are "not fussy" (last sentence) are not fussy about
- E where they live.
 - F whom they associate with.
 - G how they are treated.
 - H what they eat.
-

Go on to the next page.

Mario, Deacon Clapp's hired man, was the first Italian to settle in Oakley. He was sociable and felt a strong interest in the town. Once, when Luke Dunn was soliciting contributions for the Oakley baseball team, he got five dollars from the Deacon, ten from Dan Freeman, and five from Bob Moore, all within sight of the field where Mario was plowing.

That afternoon at milking time Mario hung his head and a tear dropped into the pail. He would not eat and went to bed and turned his face to the wall. In the middle of the night he told his wife what was wrong. He had his first papers and knew the answers for his second papers. People spoke to him; his children went to school. Still he did not belong. Other men gave money for the team; he was not asked. His son Fripper, the newsboy, heard what was said and dropped in early the next morning at Luke's. If Mario missed his supper, Luke could not swallow his breakfast. He stayed home from work and made a list of all the Italians in Oakley, ruling it in red ink. At ten o'clock, he dressed in his best clothes and called on Mario, who was plowing doggedly.

"Mario," he said, "you're just the man I wanted to see. I've canvassed a few individuals, but the boys suggested that you be head solicitor of the Italian-American colony. Will you ask the men I have listed here to chip in for the baseball uniforms?"

Suddenly in Mario's ears the orioles sang; he was aware of the brightness of the sun and the fragrance of the earth. He saw the red ink, the neat columns, and his name at the top. He understood now why, in the canvass of mere individuals, not the heads of national groups, he had not been approached the day before.

- 31 When Luke did not ask for a contribution, Mario was
- | | |
|----------|-------------|
| A angry. | C puzzled. |
| B hurt. | D relieved. |

- 32 Probably the reason Luke did not ask Mario to contribute in the first place was that Luke
- | | |
|---|--|
| E thought he did not have the money to spare. | |
| F intended to call on him the next day. | |
| G was not acquainted with Mario. | |
| H thought his contribution would be too small to bother with. | |
- 33 Luke can best be described as
- | | |
|------------------------|--|
| A generous with money. | |
| B vain. | |
| C cruel. | |
| D tenderhearted. | |
- 34 Luke was also
- | | |
|------------|-------------------|
| E awkward. | G truthful. |
| F tactful. | H self-important. |
- 35 The "papers" referred to in the second paragraph were
- | |
|----------------------------------|
| A newspapers. |
| B school examinations. |
| C citizenship papers. |
| D the list of Italian-Americans. |
- 36 It is obvious that Fripper
- | |
|--|
| E told Luke how his father felt. |
| F told his father that Luke would soon visit him. |
| G let his father know that he knew what the trouble was. |
| H wanted to play on the baseball team. |
- 37 Mario wanted most of all to
- | |
|---|
| A have a good baseball team. |
| B have his son participate in school activities. |
| C feel himself part of the town. |
| D be the most important man in the Italian-American colony. |
- 38 In the last paragraph, Mario is pictured as
- | | |
|-----------|-----------------|
| E happy. | G disappointed. |
| F amused. | H bewildered. |

Go on to the next page.

We noted that Faraday in this country and Henry in America by their discovery of electromagnetic induction brought electricity into use. It was not long before this was applied to the sending of messages.

5 In 1840 Wheatstone brought a project before the House of Commons for a cable between Dover and Calais. In 1843 Morse wrote to the Secretary of the United States about the experiments he had made with a telegraph in 1844 between Washington and
10 Baltimore and expressed his confidence that communication could be established across the Atlantic. In 1848 Morse did stretch under New York harbor a submarine cable that was successful.

In 1850 a Mr. Brett, a Scottish engineer working
15 in London, obtained a concession to lay a cable under the Straits of Dover. Although the newspapers regarded the project as a gigantic swindle, the cable of solid copper wire coated with gutta-percha was laid and communication established.

20 After messages had come through for a few hours, they failed. The explanation was that an industrious fisherman had pulled up the cable in his trawl and, having a good hacksaw on board, had cut out a section. This he took back to Boulogne and exhibited
25 as a rare and precious seaweed with a golden center.

In 1851 an improved cable was laid under the Straits and was successful. Others followed to Ireland and the Continent—but the Atlantic remained unconquered.

39 The writer of this passage appears to be

- | | |
|-------------|-------------|
| A American. | C English. |
| B Irish. | D Scottish. |

40 The writer has made a mistake in a date. In which one of the following pairs are the dates inconsistent with each other?

- E 1840 in line 5 and 1843 in line 7
F 1843 in line 7 and 1844 in line 9
G 1844 in line 9 and 1848 in line 12
H 1850 in line 14 and 1851 in line 26

41 Which one of the following men is regarded by the writer as *not* well-known?

- | | |
|-----------|--------------|
| A Faraday | C Wheatstone |
| B Brett | D Morse |

42 The newspapers regarded the first laying of a cable under the Straits of Dover as

- E costly but useful.
F harmless but impracticable.
G dishonest and fraudulent.
H worth while but not likely to succeed.

43 The center of the "seaweed" exhibited in Boulogne was

- A gutta-percha.
B yellow vegetable matter.
C copper.
D gold.

44 The writer says Morse laid a cable

- E under the Straits of Dover.
F under New York harbor.
G under the Atlantic.
H between England and the Continent.

45 In the material following this passage the writer will probably discuss

- A attempts to lay a cable under the Atlantic.
B the fate of Wheatstone's proposal to the House of Commons.
C what happened to the fisherman.
D Faraday's and Henry's electromagnetic experiments.

- - - - -

Go on to the next page.

A woman whose son had invited his Sunday-school class for a Saturday afternoon party went to the drugstore for a gallon of ice cream. There was a high-school girl at the soda fountain and she said that she didn't think she ought to sell a gallon—it might leave the fountain short of supplies. Thinking fast, the woman said, "Well, all right. Let me have four quarts, then."

"O.K.," the young lady said, beaming at this display of good sportsmanship. "What flavors?"

- 55 There is no point to the story unless the reader knows that
- A there was a shortage of ice cream at the time.
 - B the woman thinks that four quarts of ice cream are less than a gallon.
 - C a gallon contains four quarts.
 - D high-school girls make poor salesgirls.
- 56 The purpose of the writer is to
- E criticize the woman for taking advantage of the girl.
 - F show that there really was no shortage of ice cream.
 - G point out the advantages of good sportsmanship.
 - H tell an amusing story.

- - - - -

Dr. Ringer drew one of his newly perfected matches out of a desk drawer and permitted us to inspect it at a distance of four feet. It was three inches long and a little thicker than a wooden kitchen match and was made of a grayish substance. He poked it into the flame of an ordinary match and nothing happened. He then struck it against a piece of brown stone and it ignited. "It will light only from a special striker, which is everlasting," the Doctor said. "You get at least eighty lightings, of four seconds each, to an inch. It takes only two seconds to light a cigarette; so you can light around five hundred cigarettes with each match."

- 57 The main advantage of the new match is that it
- A remains burning longer than an ordinary match.
 - B burns with a hotter flame than an ordinary match.
 - C can be lighted only with a special striker.
 - D can be used many times.
- 58 After the new match has been lighted eighty times (four seconds to each lighting), it will be about
- E 1 inch long.
 - F 2 inches long.
 - G $2\frac{1}{2}$ inches long.
 - H 3 inches long.
- 59 The passage indicates that Dr. Ringer
- A did not invent the new match.
 - B thinks the new match is dangerous.
 - C would not let the writer handle the new match.
 - D does not expect the new match to become popular.
- 60 It seems likely that Dr. Ringer overestimated the number of cigarettes that could, in everyday use, be lit with one of the new matches since
- E it takes less than two seconds to light a cigarette.
 - F the part of the match held in the fingers cannot be burned.
 - G a special striker must be used.
 - H he does not say he has actually counted the number.

**Look over your work on this part.
Do not go back to Part I.**

APPENDIX C
SOCIOECONOMIC SCALES

DIRECTIONS: In the following questions mark your answer by putting a circle in the right place. For example, in the question "Does your family own a car?" draw a circle around the YES if your family does own a car, and around the NO if it does not. Be sure to answer all the questions.

- | | | |
|--|-----|----|
| 1. Does your family own a car? | YES | NO |
| 2. Does your family have a garage or carport? | YES | NO |
| 3. Did your father go to high school? | YES | NO |
| 4. Did your mother go to high school? | YES | NO |
| 5. Did your father go to university? | YES | NO |
| 6. Did your mother go to university? | YES | NO |
| 7. Is there a writing desk in your home? | YES | NO |
| 8. Does your family have a Hi-Fi or record player? | YES | NO |
| 9. Does your family have a piano? | YES | NO |
| 10. Does your family get a daily newspaper? | YES | NO |
| 11. Do you have your own room at home? | YES | NO |
| 12. Is there an encyclopedia in your home? | YES | NO |
| 13. Does your family own its own home? | YES | NO |
| 14. Does your family have more than 100 hard cover books?
(four shelves about three feet long) | YES | NO |
| 15. Did your parents borrow any books from the library in
the past year? | YES | NO |
| 16. Does your family leave town each year for a holiday? | YES | NO |
| 17. Do you belong to any club where you have to pay fees? | YES | NO |
| 18. Does your mother belong to any club or organizations
such as study, church, art, or social? | YES | NO |
| 19. Does your father belong to any such clubs or organizations? | YES | NO |
| 20. Have you ever had lessons in music, dancing, art, swimming,
etc., outside of school? | YES | NO |
| 21. What is your father's occupation? (Be specific. For example: sales clerk
at Eaton's, Door-to-door salesman for Fuller Brush, travelling salesman for
Massey-Ferguson, high school teacher) | | |

APPENDIX D

QUESTIONNAIRE ON READING HABITS

QUESTIONNAIRE ON READING HABITS

1. Approximately how many books does your family have at home? _____
2. a. Encircle the number of books that you have read and for which you have received credit so far this school term, 1965 - 66.
0. 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14 or more, specify the number _____
- b. How many books have you read this school year for which you have not requested credit?
0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14 or more, specify the number _____
3. Do you find reading pleasurable? Check one of the following:
_____ never _____ often
_____ rarely _____ always
_____ sometimes
4. Apart from the reading you do for your school courses and assignments, what are your reading habits? Choose three, labelling them 1, 2, 3, in order of importance.
_____ at every opportunity
_____ in preference to other forms of recreation
_____ when I am required to read
_____ often when I should be doing home assignments
_____ in my free time at school
5. Check which of the following types of reading material you prefer:
_____ poetry _____ prose _____ newspapers _____ fact
_____ essays _____ plays _____ magazines _____ fiction
6. How many weekly magazines does your family receive? _____
How many monthly magazines does your family receive? _____
7. How often do you read magazines? Check One:
_____ every day _____ once a month
_____ two or three days a week _____ seldom or never
_____ once a week
8. How often do you read a newspaper? Check one:
_____ every day _____ once a week
_____ two or three days a week _____ seldom or never
9. Check which of the following you read in the newspapers:
_____ comics _____ local news _____ editorials
_____ sports _____ national news _____ columns
_____ society _____ foreign news

APPENDIX E
RAW SCORES ON ALL TESTS

Variables for Raw Data

1. Identification Number
2. STEP Essay Scores
3. Intelligence Scores
4. Socioeconomic Scores
5. Vocabulary Scores
6. Reading Comprehension Scores
7. Sex: 0 if Male, 1 if Female
8. Teacher: 0 if Teacher A, 1 if Teacher B.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-----|----|-----|----|----|----|---|---|
| 001 | 5 | 95 | 35 | 38 | 20 | 0 | 0 |
| 002 | 5 | 100 | 41 | 28 | 14 | 1 | 0 |
| 003 | 5 | 85 | 45 | 27 | 15 | 0 | 0 |
| 004 | 7 | 101 | 37 | 40 | 38 | 1 | 0 |
| 005 | 5 | 93 | 20 | 23 | 24 | 0 | 0 |
| 006 | 5 | 91 | 30 | 21 | 25 | 0 | 0 |
| 007 | 8 | 112 | 45 | 31 | 34 | 1 | 0 |
| 008 | 6 | 92 | 33 | 26 | 19 | 0 | 0 |
| 009 | 5 | 102 | 45 | 38 | 36 | 0 | 0 |
| 010 | 6 | 109 | 42 | 42 | 44 | 0 | 0 |
| 011 | 5 | 108 | 73 | 27 | 24 | 0 | 0 |
| 012 | 7 | 107 | 60 | 37 | 46 | 1 | 0 |
| 013 | 3 | 82 | 15 | 26 | 22 | 0 | 0 |
| 014 | 6 | 108 | 26 | 42 | 51 | 0 | 0 |
| 015 | 3 | 91 | 91 | 40 | 36 | 0 | 0 |
| 016 | 4 | 107 | 44 | 38 | 38 | 0 | 0 |
| 017 | 6 | 106 | 40 | 37 | 37 | 0 | 0 |
| 018 | 7 | 115 | 40 | 29 | 27 | 1 | 0 |
| 019 | 6 | 94 | 37 | 27 | 27 | 0 | 0 |
| 020 | 5 | 102 | 83 | 36 | 45 | 0 | 0 |
| 021 | 6 | 103 | 56 | 30 | 37 | 1 | 0 |
| 022 | 6 | 95 | 76 | 38 | 33 | 0 | 0 |
| 023 | 5 | 95 | 45 | 34 | 27 | 0 | 0 |
| 024 | 6 | 117 | 86 | 35 | 39 | 0 | 0 |
| 025 | 7 | 123 | 91 | 43 | 42 | 0 | 0 |
| 026 | 5 | 108 | 52 | 49 | 38 | 0 | 0 |
| 027 | 5 | 113 | 40 | 35 | 47 | 0 | 0 |
| 028 | 9 | 121 | 72 | 46 | 54 | 0 | 0 |
| 029 | 9 | 119 | 50 | 49 | 52 | 0 | 0 |
| 030 | 8 | 119 | 43 | 42 | 42 | 0 | 0 |
| 031 | 6 | 115 | 66 | 33 | 41 | 0 | 0 |
| 032 | 5 | 108 | 32 | 32 | 28 | 1 | 0 |
| 033 | 6 | 95 | 39 | 39 | 28 | 0 | 0 |
| 034 | 8 | 104 | 49 | 38 | 41 | 1 | 0 |
| 035 | 6 | 129 | 43 | 44 | 47 | 0 | 0 |
| 036 | 8 | 127 | 41 | 36 | 51 | 0 | 0 |
| 037 | 8 | 104 | 56 | 54 | 43 | 1 | 0 |
| 038 | 11 | 111 | 49 | 38 | 48 | 0 | 0 |
| 039 | 10 | 112 | 48 | 34 | 43 | 1 | 0 |
| 040 | 7 | 114 | 59 | 37 | 26 | 0 | 0 |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-----|----|-----|----|----|----|---|---|
| 041 | 8 | 106 | 48 | 35 | 33 | 1 | 0 |
| 042 | 11 | 114 | 60 | 47 | 48 | 1 | 0 |
| 043 | 3 | 114 | 85 | 45 | 42 | 0 | 0 |
| 044 | 4 | 107 | 40 | 35 | 38 | 0 | 0 |
| 045 | 8 | 114 | 47 | 36 | 37 | 1 | 0 |
| 046 | 8 | 124 | 56 | 48 | 49 | 0 | 0 |
| 047 | 7 | 117 | 30 | 37 | 33 | 1 | 0 |
| 048 | 8 | 106 | 21 | 34 | 39 | 1 | 0 |
| 049 | 7 | 110 | 51 | 29 | 5 | 0 | 0 |
| 050 | 5 | 103 | 70 | 38 | 45 | 0 | 0 |
| 051 | 8 | 115 | 59 | 41 | 52 | 0 | 0 |
| 052 | 5 | 98 | 85 | 37 | 35 | 1 | 0 |
| 053 | 5 | 101 | 75 | 36 | 35 | 0 | 0 |
| 054 | 8 | 109 | 38 | 40 | 35 | 1 | 0 |
| 055 | 7 | 115 | 37 | 40 | 42 | 1 | 0 |
| 056 | 9 | 105 | 71 | 40 | 48 | 0 | 0 |
| 057 | 6 | 99 | 47 | 35 | 21 | 0 | 0 |
| 058 | 8 | 99 | 50 | 37 | 28 | 0 | 0 |
| 059 | 8 | 111 | 43 | 29 | 31 | 0 | 0 |
| 060 | 8 | 124 | 57 | 52 | 54 | 0 | 0 |
| 061 | 8 | 115 | 74 | 41 | 44 | 0 | 0 |
| 062 | 10 | 102 | 32 | 43 | 25 | 1 | 0 |
| 063 | 6 | 96 | 37 | 31 | 34 | 0 | 0 |
| 064 | 7 | 100 | 32 | 27 | 21 | 1 | 0 |
| 065 | 8 | 111 | 54 | 37 | 37 | 1 | 0 |
| 066 | 6 | 105 | 77 | 34 | 44 | 1 | 0 |
| 067 | 8 | 115 | 72 | 54 | 57 | 0 | 0 |
| 068 | 7 | 118 | 33 | 30 | 38 | 1 | 0 |
| 069 | 7 | 99 | 38 | 36 | 40 | 0 | 0 |
| 070 | 6 | 86 | 27 | 35 | 20 | 0 | 0 |
| 071 | 7 | 103 | 51 | 40 | 36 | 1 | 0 |
| 072 | 6 | 114 | 45 | 39 | 44 | 0 | 0 |
| 073 | 9 | 116 | 73 | 43 | 36 | 1 | 0 |
| 074 | 9 | 106 | 66 | 35 | 25 | 1 | 0 |
| 075 | 7 | 93 | 17 | 19 | 27 | 1 | 0 |
| 076 | 5 | 104 | 53 | 38 | 36 | 1 | 0 |
| 077 | 8 | 109 | 83 | 49 | 54 | 0 | 1 |
| 078 | 9 | 116 | 54 | 47 | 50 | 0 | 1 |
| 079 | 6 | 129 | 51 | 51 | 55 | 0 | 1 |
| 080 | 9 | 118 | 70 | 45 | 45 | 1 | 1 |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-----|----|-----|----|----|----|---|---|
| 081 | 12 | 120 | 40 | 51 | 54 | 1 | 1 |
| 082 | 9 | 127 | 32 | 48 | 47 | 1 | 1 |
| 083 | 7 | 121 | 76 | 33 | 41 | 1 | 1 |
| 084 | 9 | 133 | 40 | 44 | 56 | 1 | 1 |
| 085 | 8 | 115 | 58 | 40 | 48 | 0 | 1 |
| 086 | 10 | 119 | 38 | 42 | 54 | 1 | 1 |
| 087 | 11 | 119 | 52 | 46 | 53 | 1 | 1 |
| 088 | 11 | 149 | 98 | 56 | 58 | 0 | 1 |
| 089 | 9 | 112 | 66 | 40 | 55 | 1 | 1 |
| 090 | 10 | 120 | 74 | 52 | 49 | 0 | 1 |
| 091 | 8 | 139 | 83 | 45 | 56 | 1 | 1 |
| 092 | 8 | 117 | 32 | 53 | 51 | 1 | 1 |
| 093 | 6 | 129 | 39 | 44 | 53 | 1 | 1 |
| 094 | 12 | 119 | 58 | 47 | 48 | 0 | 1 |
| 095 | 9 | 131 | 65 | 55 | 54 | 0 | 1 |
| 096 | 7 | 130 | 73 | 40 | 54 | 1 | 1 |
| 097 | 12 | 151 | 32 | 53 | 56 | 0 | 1 |
| 098 | 10 | 135 | 49 | 53 | 59 | 0 | 1 |
| 099 | 6 | 112 | 79 | 49 | 45 | 0 | 1 |
| 100 | 8 | 111 | 73 | 39 | 32 | 1 | 1 |
| 101 | 8 | 100 | 77 | 35 | 35 | 1 | 1 |
| 102 | 6 | 101 | 27 | 35 | 47 | 1 | 1 |
| 103 | 7 | 101 | 66 | 37 | 31 | 1 | 1 |
| 104 | 10 | 114 | 56 | 39 | 22 | 1 | 1 |
| 105 | 10 | 125 | 39 | 48 | 45 | 1 | 1 |
| 106 | 9 | 118 | 48 | 38 | 44 | 1 | 1 |
| 107 | 7 | 109 | 45 | 44 | 32 | 1 | 1 |
| 108 | 8 | 120 | 77 | 44 | 54 | 1 | 1 |
| 109 | 8 | 124 | 47 | 50 | 56 | 1 | 1 |
| 110 | 10 | 96 | 37 | 34 | 39 | 1 | 1 |
| 111 | 9 | 119 | 28 | 44 | 54 | 1 | 1 |
| 112 | 10 | 127 | 57 | 47 | 57 | 1 | 1 |
| 113 | 9 | 108 | 26 | 38 | 31 | 1 | 1 |
| 114 | 7 | 95 | 14 | 26 | 26 | 1 | 1 |
| 115 | 6 | 116 | 30 | 35 | 29 | 1 | 1 |
| 116 | 6 | 102 | 53 | 28 | 35 | 1 | 1 |
| 117 | 7 | 88 | 21 | 25 | 34 | 1 | 1 |
| 118 | 10 | 116 | 36 | 51 | 54 | 1 | 1 |
| 119 | 11 | 123 | 36 | 52 | 51 | 1 | 1 |
| 120 | 6 | 110 | 49 | 40 | 35 | 1 | 1 |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|-----|----|-----|----|----|----|---|---|
| 121 | 7 | 130 | 43 | 43 | 50 | 0 | 1 |
| 122 | 9 | 99 | 48 | 41 | 37 | 0 | 1 |
| 123 | 6 | 99 | 23 | 28 | 23 | 0 | 1 |
| 124 | 4 | 112 | 49 | 25 | 35 | 0 | 1 |
| 125 | 8 | 102 | 62 | 32 | 16 | 0 | 1 |
| 126 | 8 | 106 | 39 | 32 | 33 | 0 | 1 |
| 127 | 7 | 116 | 30 | 38 | 57 | 1 | 1 |
| 128 | 4 | 106 | 18 | 25 | 23 | 0 | 1 |
| 129 | 4 | 110 | 46 | 41 | 34 | 0 | 1 |
| 130 | 7 | 117 | 40 | 38 | 43 | 0 | 1 |
| 131 | 5 | 109 | 56 | 36 | 34 | 0 | 1 |
| 132 | 4 | 111 | 31 | 43 | 40 | 0 | 1 |
| 133 | 9 | 97 | 34 | 36 | 35 | 1 | 1 |
| 134 | 10 | 109 | 46 | 47 | 18 | 0 | 1 |
| 135 | 8 | 106 | 57 | 41 | 41 | 1 | 1 |
| 136 | 7 | 111 | 76 | 50 | 40 | 0 | 1 |
| 137 | 7 | 103 | 39 | 41 | 41 | 0 | 1 |
| 138 | 5 | 103 | 82 | 32 | 9 | 0 | 1 |
| 139 | 8 | 103 | 64 | 38 | 50 | 1 | 1 |
| 140 | 5 | 103 | 28 | 45 | 37 | 0 | 1 |
| 141 | 6 | 115 | 37 | 35 | 43 | 0 | 1 |
| 142 | 6 | 112 | 52 | 33 | 25 | 0 | 1 |
| 143 | 7 | 134 | 74 | 44 | 36 | 1 | 1 |
| 144 | 10 | 113 | 66 | 45 | 49 | 1 | 1 |
| 145 | 5 | 108 | 48 | 27 | 30 | 0 | 1 |
| 146 | 6 | 101 | 38 | 33 | 13 | 0 | 1 |
| 147 | 4 | 84 | 23 | 15 | 13 | 0 | 1 |

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